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Shop Equipment Review

Every item of machinery, tools, mechanisms, parts and materials described in the Shop Equipment News department of American Machinist during the last six months of 1931 is reviewed, plus all items published in the Engineering Workshop Equipment department of the European Edition for June to November, 1931, inclusive

WITH this issue we present the eighteenth consecutive edition of the *American Machinist* Semi-Annual Shop Equipment Review. It will be found to contain condensed descriptions of 470 items of machine tools, materials and equipment published week by week in *American Machinist* during the last six months of 1931. The trends noted in the Review of the first six months of that year (*AM*—Vol. 75, page 85) will be found to have been much extended. The necessities of an era of restricted manufacturing simply had to be answered by flexible, highly productive, cost-cutting devices and materials. No class of shop equipment could withstand the demand for redesign; in the process many of last year's offerings have already become obsolescent if not obsolete.

The experienced shop executive will see quickly that the buyer is now getting more value in machine tools and equipment than ever before. Lathes are still called lathes, and milling machines are still called milling machines—few if any names have changed—but their vastly increased productivity and accuracy could scarcely have been imagined twenty, ten, or even five years ago. Machine tools have all been redesigned and improved, made heavier, of higher grade materials, better workmanship. Since the value per dollar is greater by far, it should be obvious that lower prices cannot be expected. It should always be borne in mind that the builder cannot trim his large development expense without permanent injury to the whole machinery and metal-working industry. Progress must be paid for.

In the field of metal cutting machines, the trends toward simplified control and flexibility are largely due to new results obtained with the cemented carbides and improved high-speed steel. Feeds and speeds have been increased remarkably to make full use of these materials, manufacturers having incorporated extra capacity to anticipate rapid development in machining practices. Consideration has been given to hydraulic operation, heavier design, the newest in materials and accessories, higher powered motors, improved electrical controls, better workholding devices, and welded steel construction.

Hydraulic operation of machine tools has been much extended and improved. Twenty-three American and eight European machines make use of the hydraulic principle for feeds, rapid traverses, changing feeds and speeds, chucking, vises, shear hold-downs, and cushioning of reciprocating movements. These devices permit more developed power to be applied to the tool, infinite changes over the feed and speed range, and simple control devices. Often the entire control is concentrated at one hand valve. Electrical devices are frequently added to assist in controlling the cycle.

All previous standards in rigidity and materials have been eclipsed during the year—particularly during the last six months. Types of machines that lend themselves most readily to welded steel construction have gone over rapidly to this mode. Outstanding are both crank and hydraulic presses and shears. Cross-sections of cast structures have been much increased to withstand heavier loads and higher speeds. Alloy cast irons and alloy cast steels are finding extensive uses. Shafts, gears, and reciprocating parts are today made almost entirely from alloy steels of a wide variety of analyses. Many such parts are nitrided and most are heat-treated. Almost every machine makes extensive use of antifriction bearings for spindle and gear mountings, and many are entirely equipped in this manner.

For various reasons lubrication has become an especially vital factor in machine construction, there being real need for eliminating the human element in lubrication of expensive, high-speed machinery. In many cases, the oil used in the hydraulic system is also diverted to the lubrication system. Oil reservoirs are of large capacity to permit freeing the oil of heat and air. In some designs two separate force-feed lubrication systems are employed, one for slow- and intermediate-speed shafts, and the other used exclusively for high-speed shafts mounted in antifriction bearings.

Electrification of machine drives and functions proceeds at an amazing pace. Almost every machine built is furnished with motor drive, but of course many are not direct-connected. Flat belts, V-belts and chains all compete as transmission mediums in connection with motors mounted on brackets or on pivoting baseplates. Multiple-disk clutches and electrically operated brakes are fitted to give smooth starting and positive stopping. To deliver maximum power at the tool or the grinding

wheel, and to eliminate considerable intermediate transmission equipment previously employed, some machines now have the motors mounted directly on the spindle. Where a multiplicity of functions is combined in one machine, the tendency is to drive each by an individual motor. Frequently, all motors are interlocked at a central control station. Should any one function of the machine fail, the entire machine is shut down to prevent damage or improper operation. Protective devices for overload conditions, no-voltage, and failure of phases in a polyphase system are being increasingly applied. In addition, pushbuttons are located conveniently at every working position of the machine.

A glance through the pages reveals many outstanding achievements. A boring mill features heads with steel rams. Redesigned, heavier chucking machines are built for advanced machining practices and are suitable for both large and small parts on flexible production schedules. Drilling machines feature the motor-on-spindle, and multiple-spindle designs have hydraulic feeds and improved heads for work of a variety of sizes.

Automotive demands have caused evolution in gear cutting machines. Examples of this are an electrical control for a gear shaper, and improved hobbers for helical gears. Gear finishing methods, such as burnishing and lapping, have also received attention. Surface grinders incorporate motor-on-spindle design, hydraulic table feeds, and hydraulic cross feeds to the head. Electrical controls operate functions on ball-race and cam grinders.

Lathes have undergone considerable redesign for the use of carbide tools. Speeds and feeds have been increased, necessitating better bearings, larger motors and heavier cross-sections. Controls are simplified. One automatic lathe is completely hydraulic, including spindle rotation and feeds for both carriages.

One milling machine has speeds from 15 to 1,500 r.p.m. in 27 steps to take care of both large and very small cemented carbide cutters. Presses feature all-steel construction for both crank and hydraulic types. All-steel construction is also used for a shear with hydraulic hold-downs and a non-floating knife bar. A tapping machine definitely limits the load on the tap, so that tap breakage and burred holes are eliminated.

European equipment also presents striking advances in the field of production machines, principally in hydraulic and electrical controls. The methods of handling design elements in many cases offer interesting contrast to American practice. Both unusual fixtures and tool mountings are to be found.

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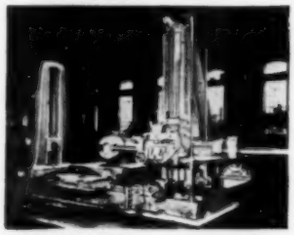
Boring and Turning Machines

Boring, Drilling and Milling Machine, Horizontal

Joseph T. Ryerson & Son, Inc., Chicago, Ill. [Vol.75,p. 188.] 27.

Specifications of this Ohio machine are: diameter of spindle, 5 in.; continuous feed to spindle, 36 in.; reset to spindle, 40 in.; working surface of table, 60x96 in.; cross feed, 94 in.; distance top of table to center line of spindle, 85½ in.; maximum distance faceplate to



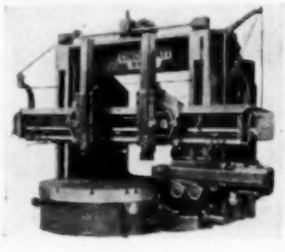
bar support, 168 in.; 18 speeds, all reversible; eight boring and drilling feeds, and 16 milling feeds to the head, table and saddle, also reversible.

The machine is equipped with a 60-in. power- and hand-driven revolving table and a thread chasing attachment. All controls may be operated from the head.

Boring Mill, Side-Head, 96-In., "Hypro"

Cincinnati Planer Co., Cincinnati, Ohio. [Vol.75,p.973.]

Stiffer support for the housings of the 96-in. "Hypro" side-head boring mill is achieved by casting the bed and its extensions as an integral unit. Forced-feed lubrication is supplied to the faceplate spindle bearings, the track and the gearbox. Each rail head is equipped with a steel ram, is lubricated from a central station, and can be swivelled 45 deg. Fine adjustment levers are supplied so that the heads can be set at any position along the rail. A feed box having twelve changes is placed on each end of the rail and on the side head Individual motor drive for each head is furnished. On the side head the ram can be placed in any position, and the resultant tool pressure is always within the housing bearing.

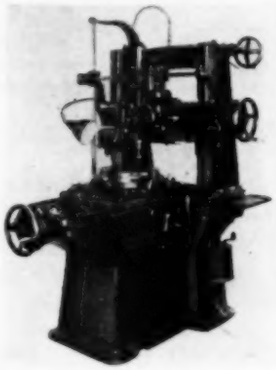


Boring Machine, Jig, No. 3½, Hauser

Index Machinery Corp., 49 Central Ave., Cincinnati, Ohio. [Vol.75,p.573.] 188.

The chief improvement is the device whereby alignment between the crossrail of the machine, the boring spindle and the table is maintained at all times. This is accomplished by a series of hardened and ground locating blocks fastened to the two upright housings and upon which are suitable arms fastened to the crossrail rest. A special tool is provided for setting the axis of the boring spindle true with the axis of the circular table.

Range of this machine is as follows: Horizontal travel, 24

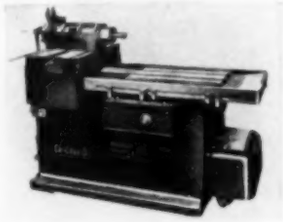


in.; transverse travel, 16 in.; working surface of the table, 26x16 in., with a maximum of 24 in. between the housings.

Boring Machine, Diamond, Horizontal, Model No. 112

Ex-Cell-O Aircraft & Tool Corp., 1200 Oakman Blvd., Detroit, Mich. [Vol.75,p.537.] 168.

The machine is a single-end type and is equipped with one bridge, on which is mounted from one to three motor-driven boring units. The 16x25-in. fixture table is provided with flat and V-ways. The hydraulic

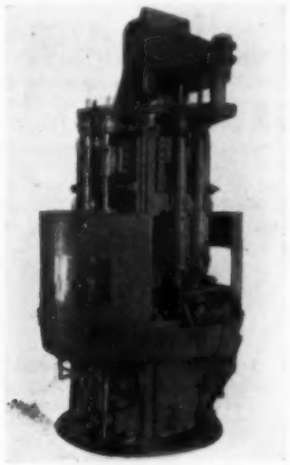


unit, which operates the machine, and the fixture if required, is driven by a 2-hp. motor, which also drives both the coolant and oil pumps. Feeds of 0.0005 in. per revolution of the spindle and up are obtainable. This type of machine is adapted to diamond boring pistons, connecting rods, motor-end frames and similar parts of non-ferrous metals and Bakelite or fiber.

Boring Machine, Diamond, Vertical, Continuous

Automatic Machine Co., Bridgeport, Conn. [Vol.75,p. 826.] 295.

The Coulter diamond-tool boring machine is of the vertical 4-station, revolving-turret type. Designed for large-quantity machining of bearing holes in connecting rods, pistons, bushings, and parts of a similar nature, it is a self-contained motor-driven



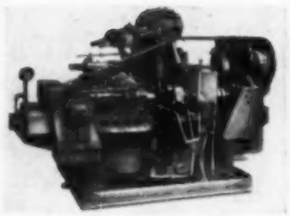
unit. Completely automatic action is featured.

Power is taken from the motor by means of a V-belt, to a jackshaft and thence by means of V-belts contacting all boring spindle sheaves, except those at the loading position. As the turret revolves, the boring-spindle sheaves leaving the finished position move out of contact with the V-belts so that the spindles stop before reaching the unloading position. Spindles are splined to permit the rise and fall of the spindle heads as controlled by the feed cam.

Boring, Facing and Tapping Machine, Radiator-Loop, Improved, R-600

Moline Tool Co., Moline, Ill. [Vol.75,p.864] 317.

Improvements have been made in the radiator-loop boring, facing and tapping machine [*AM*—Vol.70,page1025]. Hydraulic actuation by an Oilgear pump is now used for the facing operation, and individual leadscrews are employed for the tapping spindles. Each facing tool and each tap can be adjusted individually for depth, and the control of the depth of tapping or reverse is entirely



independent of the leadscrews. Three different speeds for tapping and facing are furnished.

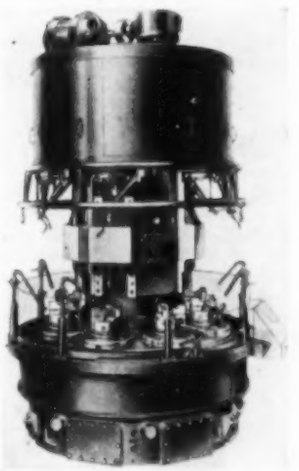
Chucking Machines and Center Lathe, "Mult-Au-Matic"

Bullard Co., Bridgeport, Conn. [Vol.75,p.1004] 377.

The Type D Mult-Au-Matic chucking machine and the Type D center lathe have been designed for much greater rigidity, high speeds, greater output, and more convenient operation. Each machine may be obtained with either six or eight spindles. The cylindrical base column, and tool carrying heads are massively built. Redesign of the carrier affords a single-piece casting, providing solid support for the work-spindles.

The work-spindles are now mounted in a pair of preloaded roller bearings. A spindle brake mechanism operates during indexing to bring all spindles to a stop. They are also applicable to power-operated chucking if desired. The feed mechanisms now have anti-friction bearings. A system of automatic slide lubrication has been included.

A gear pump delivers oil



from the reservoir to filters, and it is then passed through the drive bracket and distributed to the feed works, thence to the tool heads and all other moving parts. An individual line delivers filtered lubricant to the spindle bearings.

The Type C Mult-Au-Matic is built in six or eight spindle models. Through the combination of main head and tool column heads at each of the work stations, it is possible to approach the smaller work for

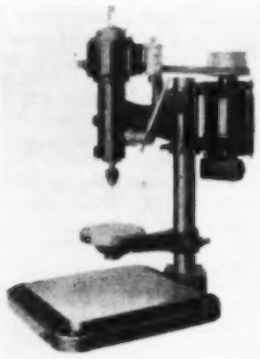
which this machine is designed, from different directions for concentrated operations at close quarters and still maintain in the inoperative position sufficient room for easy tool setting. Mechanical power - operated chucks are included.

Drilling Machines

Drilling Machine, Sensitive, Bench, High-Speed

United Engine & Machine Co., San Leandro, Calif. [Vol. 75,p.219.] 24.

High-speed drilling of small holes from 0.006 to ¼ in. can be done on this bench drill. Both the motor and rotating parts of the drill press are carried on ball bearings. The head can be



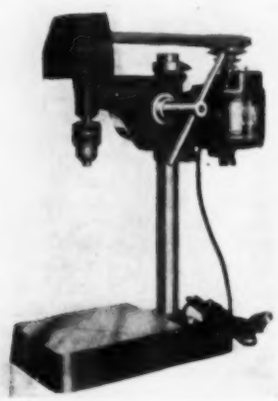
swung on the column for the full 360 deg.

Spindle travel is 3 in., and the speeds are 5,000, 7,500 and 10,000 r.p.m. under load. Distance from spindle to column, 6½ in.; vertical travel of quill, 3 in.; travel of head, 7½ in.; vertical travel of table, 11 in.; maximum distance of table from spindle, 13 in.; table diameter, 6 in.; rectangular table dimensions, 12x12½ in.

Drilling Machine, Sensitive, 13½-In., "Simplex"

Buffalo Forge Co., Buffalo, N. Y. [Vol.75,p.251.] 55.

A 4-step V-belt drive is featured. The motor can be tilted for adjusting the belts. Spindle speeds are 855, 1,210, 2,380 and 3,400 r.p.m. A grind-



ing attachment operates directly off the V-belts.

Specifications: drills to center of 13½-in. circle; travel of head, 12 in.; greatest distance between spindle nose and base, 14 in.; working surface, 8x10 in.; bench space, 10x9 in.; net weight, 83 lb.; drilling capacity, with ⅛-hp. motor, ¾ in.; drilling capacity with ¼-hp. motor, ½ in.

Drilling Machine, Motor-Spindle, No. 2

Chas. G. Allen Co., Barre, Mass. [Vol.75,p.718.] 258.

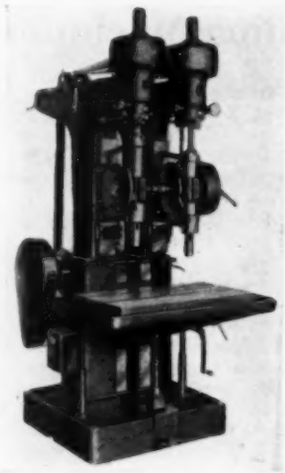
From one to six spindles and overhangs of 8, 12 and 15 in. are available in the No. 2 motor-spindle drilling machine. Four speeds in two speed ranges are available: 600, 1,200, 1,800 and 3,600 r.p.m., or 600, 900, 1,200 and 1,800 r.p.m.

The drum-type controller is mounted at the rear of the motor. Four reduced speeds may be obtained through backgears. A dial indicates the speed being used, either direct or backgeared. Standard equipment includes individual motor protection and an inclosed magnetic switch operated by a treadle for starting and stopping all spindles. Center-to-center distance of spindles is 12½ in.

Drilling Machines, Upright, No. 3

Chas. G. Allen Co., Barre, Mass. [Vol.75,p.678.] 257.

Belted-spindle drilling and tapping machines in the No. 3 size are available with from one to six spindles in 12-in. over-



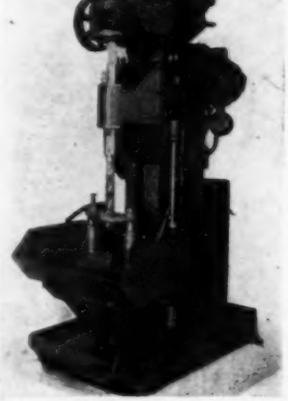
hang. Rated drilling capacity in steel is 1¼ in. Four spindle speeds are provided by a two-step spindle pulley with a two-step cone. Backgears give four additional slower speeds. The spindle is multiple splined and has a No. 4 Morse taper socket. Power feed is applied through a hardened and ground worm. A cam feed can be furnished in several different forms.

Drilling and Boring Machine, Upright, Hydraulic, No. 4-VH

Baker Bros., Inc., Toledo, Ohio. [Vol.75,p.831.] 297

The No. 4-VH hydraulic machine is adapted to either single-spindle drilling or boring, or for use with an indexing table. The saddle is actuated by a cylinder mounted on each side and working in unison. Drive is taken from the motor by means of multiple V-belts to a drive bracket carrying four gears. Two of these gears are slip change spur types, and the other pair are spiral bevels. The speed changes range from 46 r.p.m. to 836 r.p.m.

Feed for the spindle is obtained by a constant-delivery pump, driven by an independent motor. The cycle of operation is entirely automatic.



Drilling and Tapping Machine, Multiple-Spindle, Model D-5

National Automatic Tool Co., Richmond, Ind. [Vol.75,p.357.]

The Model D-5 has been designed as a universal machine with a wide range of adjustments enabling it to handle work of varying sizes. It is built as a driller only, as a tapper only, or as a combination driller and tapper. The machine

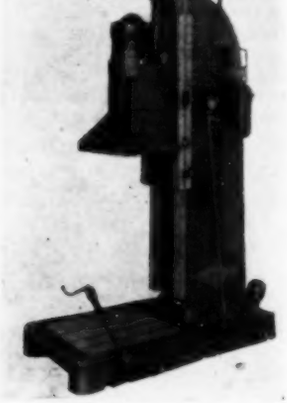
has a capacity of ten ¾-in. drills or ten ⅞-in. taps in mild steel. The head has a drilling area of 5½x10 in. Vertical adjustment of 1¼ in. is provided on all spindles to compensate for drill grinding.

The column contains electrical equipment and wiring. The arm-type limit switch controls the point of tap reversals.

Drilling and Boring Machine, Multiple-Spindle

Rockford Drilling Machine Co., Rockford, Ill. [Vol.57,p. 399.] 119.

Multiple-spindle heads are bolted directly to the face of the drive head. The counterbalanced weight is adjustable to

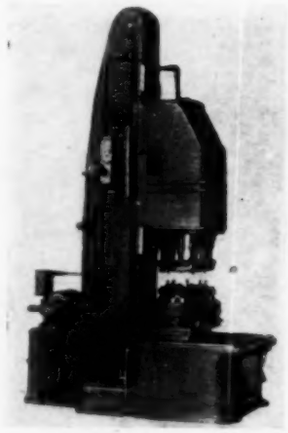


suit varying weights of the spindle heads used and the tools. The automatic operation cycle can be varied to suit requirements. Position of the head on the column can also be varied. Travel of 24 in. is available.

Drilling Machine, Multiple-Spindle, Hydraulic

National Automatic Tool Co., Richmond, Ind. [Vol.75,p.500.]

Arranged only for the mounting of fixed center heads and comparable in capacity with the standard Natco 6-in. horizontal hydraulic unit, the vertical C-12-H can be provided with either a high or a low base. A 6-in. cylinder is provided to give

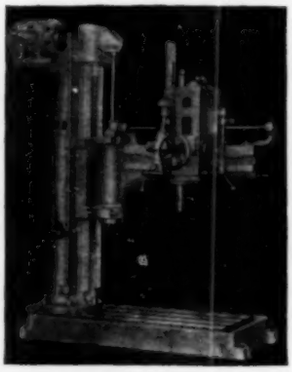


18 in. of travel, any portion of which can be used for various feeding rates. The standard Natco box valve is mounted on the left and works in connection with trip dogs on the head slide to control the head movement. Maximum feeding pressure is 5,600 lb. or 8,000 lb. A feeding rate of 15 in. per min. can be obtained.

Drilling and Tapping Machine, Radial, High-Speed

Western Machine Tool Works, Holland, Mich. [Vol. 75,p.862] 315.

Spindle speeds up to 2,000 r.p.m. can be had on this radial drilling and tapping machine, which is of all-geared construc-

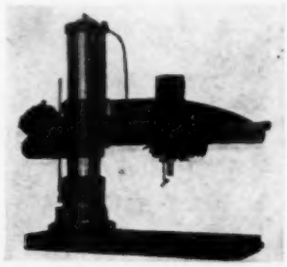


tion and is ball bearing equipped throughout. The following sizes are available: 3, 3½, 4, 4½, 5 and 6 ft. The positive speed and feed drives give six geared feeds and six geared speeds in the head. The head is regularly furnished for tapping and is easily controlled by a ball handle lever. The arm swings on roller and ball bearings.

Drilling Machine, Radial, 22-In. Column

Carlton Machine Tool Co., Cincinnati, Ohio. [Vol.75,p. 901.] 327.

A welded base is employed in the 22-in. column radial drill built with 7, 8, 9, and 10 ft. arms. A low-hung drive, which



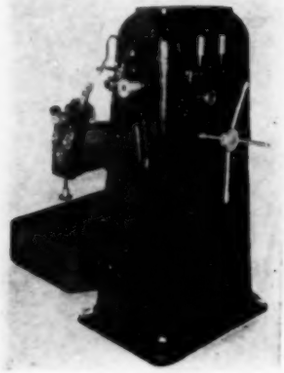
is brought down underneath the arm, drives the largest diameter of the spindle close to the work.

This radial drill can be furnished with a cutting lubricant outfit, an electric hydraulic column binder, power rapid traverse of the head, and with any style table. The machine has been made to take care of the largest and heaviest work required of a radial drill, but a range of speeds is provided to drive small twist drills at maximum speed.

Drilling and Tapping Machine, "Reading"

Textile Machine Works, Reading, Pa. [Vol.75,p.974]

Drilling oil holes and drilling and tapping setscrew holes in small parts can be done on this machine. The knee is fed toward the spindle by a handwheel. The work is mounted on a bracket or a stud, and is swung to the right for drilling

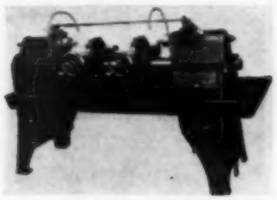


and next to the left for tapping. The drilling spindle is also made to take hollow mills. Die threading can be accomplished at the tapping spindle by using a button die. A reaming control locks the tap spindle and prevents it from moving laterally. Capacity—No. 32 to ⅞ in. drills; No. 6 to ¾-in. taps. Lateral movement of the knee is 8¾ in., and vertical adjustment of work block, ⅞ in.

Drilling and Centering Machine, No. 56 D.E.

Sundstrand Machine Tool Co., Rockford, Ill. [Vol.75,p.356.]

The tool is more than a centering machine, since reaming, spot facing and tapping operations can be performed. The right-hand head and both vises are adjustable longitudinally along the bed. Spindles can be operated simultaneously or independently. Vises can be operated independently by means of handwheels, or by special ar-



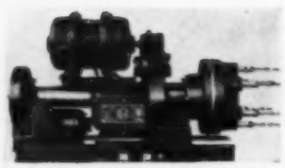
rangement both vises may be operated through the handwheel.

Machine capacity is two 1-in. drills in steel. Work diameter is 6 in., either round or hexagonal; length, up to 72 in., depending upon machine size. Speeds range from 85 to 1,800 r.p.m., depending upon motor application. Independent movement of spindles is 4 in.; simultaneous movement of spindles, 1¾ in.

Drilling Unit, Electric, Center-Feed

Baush Machine Tool Co., Springfield, Mass. [Vol.75,p. 287.] 64.

The head is provided with a quick forward motion, a positive, uniform center feed and a quick return to starting position. All movements are automatic,



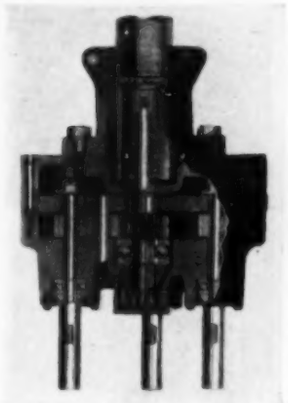
yet may be controlled by the operator by means of a four push-button station. The unit may be mounted singly or in multiple in horizontal or vertical positions for drillng, reaming, spot-facing or boring, and can be arranged for tapping.

The motor drives the main spindle through spur gearing to operate a single drill or any of the standard multiple drilling heads. Drilling speed is changed by change gears. The feed is changed by pick-off gears. Rapid traverse is given by a separate motor.

Drillhead, Multiple-Spindle

Pioneer Engineering & Mfg. Co., 8316 Woodward Ave., Detroit, Mich. [Vol.75,p.395.] 122.

Forced-feed lubrication is used in this multiple-spindle drillhead. The drillhead uses high-speed bronze bearings, one



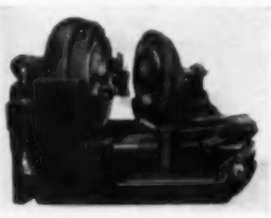
above and one below the driving gear, while ball bearings are used for thrust load. Type A is especially adaptable to jobs where close centers or staggered gear construction is necessary. Type B is adaptable to application where minimum head space is available.

Gear Cutting and Allied Machines

Gear Generator, Spiral-Bevel, No. 40

Gleason Works, 1,000 University Ave., Rochester, N. Y. [Vol.75,p.683.] 237.

As an addition to the 60 and 90-in. sizes, this company has brought out a machine to cut spiral bevel gears which are beyond the capacity of the 25-in. spiral bevel gear generator. Hypoid gears can be cut on this



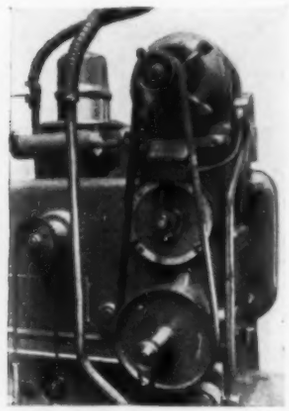
machine with a special workhead.

The machine employs a single tool which is reciprocated in a straight slide by a simple crank drive, while the blank is rotated on its axis continuously at a uniform rate. The cradle which carries the tool slide is given a slight rocking motion. Capacity, longest cone distance: 25-deg. spiral angle, 20 in.; 15-deg. spiral angle, 24 in.; largest pitch diameter, 10-1 ratio (25-deg. spiral angle), 40 in.

Gear Shaper Control, Electrical, Automatic

Fellows Gear Shaper Co., Springfield, Vt. [Vol.75,p.187.]

When arranged for motor drive, the Fellows high-speed gear shaper is now provided with an automatic electrical control. When the machine has finished its cycle, it is stopped

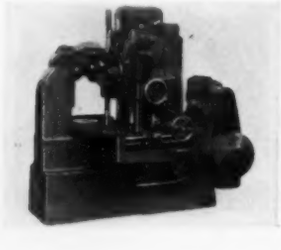


automatically by an electrical control switch attached to an extension on the rear of the motor bracket. This switch is operated by a plunger acted upon by a cam that is held on the same shaft as the regular feed cam and timed with it.

Hobbing Machines, Gear, Universal

Gould & Eberhardt, Newark (Irvington), N. J. [Vol.75,p. 469.] 113.

For accurate production of single helical and built-up herringbone gears, such as used in silent and synchro-mesh transmissions, these two universal, manufacturing-type gear hobbers are known as the 12-H and 12-H heavy. The 12-H has capacity to cut gears up to 12 in. in diameter with the support in place and 18 in. with



the support removed, and is rated for 5 D.P. in steel. The 12-H heavy is rated for 4 D.P. in steel.

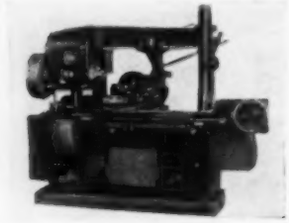
These universal type machines employ the vertical cutting principle, with the cutter slide mounted on an adjustable stanchion and the work spindle fixed in the base. The swivel cutter head has an angular adjustment of 180 deg. to permit cutting both right- and left-hand helical gears. The cycle of cutter movement comprises three phases — rapid approach, feed and rapid reverse.

Hobbing Machine, Type A

Barber-Colman Co., Rockford, Ill. [Vol.75,p.715.] 277.

Evolved from the No. 12 hobbing machine, the Type A is more sturdy, has slightly greater capacity, and contains the various attachments that have heretofore been marketed as separate units. Spiral as well as spur gears can be cut. Eight speeds are available.

The work spindle runs in bronze bearings, and its slide carries the index worm and wormgear mechanism. Work arbors are supported at the



outer end by an overarm bracket sliding on dovetail ways and provided with a rapid unloading device.

Timken roller bearings carry the hob spindle, which is mounted in a slide that swivels 50 deg. either side of zero. Longitudinal movement of the slide is accomplished by a feed screw, and it is fitted with an automatic "stabilizer" arranged to give a steady frictional drag so that the hob will not jump.

Burnishing Machine, Bevel-Pinion

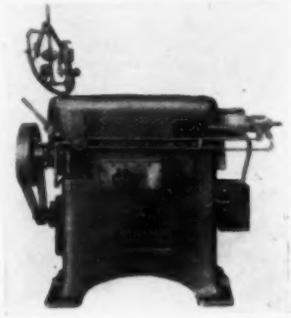
Wicaco Machine Corp., 4801 Stenton Ave., Philadelphia, Pa. [Vol.75,p.939] 330.

All types of bevel pinions can be burnished on this machine. Three master gears are revolved in engagement with the pinion being burnished, the axes of the three masters and of the pinions intersecting. The pinion is thus allowed to find its natural running position. The driving master gear has a micrometer adjustment sleeve. Through a sleeve adapter, a fixed distance is established between the pinion shoulder and stop.

Burnishing Machine, Gear, Semi-Automatic, No. 1, Bolender

City Machine & Tool Works, East Third at June Sts., Dayton, Ohio. [Vol.75,p.936] 338.

This smaller No. 1 semi-automatic burnishing machine is similar to the larger machine in that the burnishing pressure is exerted horizontally to the center of the master burnishers, the flat gear mounting avoids overhang, and a variable burnishing pressure may be secured. The cycle is controlled by a three-button switch, which permits the operator to burnish the

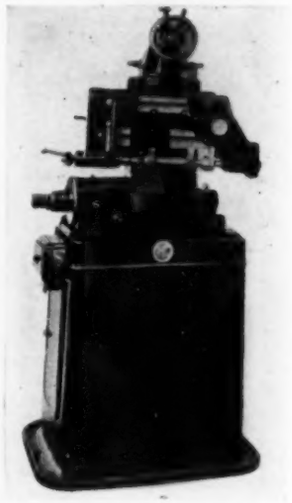


work in one direction, reverse and stop it, so ending the operation. The machine handles both spur and helical gears up to 8½ in.

Lapping Machine, Gear-Tooth, Model G.L.F., "Red Ring"

National Broach & Machine Co., Shoemaker & St. Jean Sts., Detroit, Mich. [Vol.75,p.829] 306.

Capacity for lapping 7-in. spiral transmission gears is embodied in this lapping machine. Production time is 3 to 5 min. per gear. The axes of the lap



and gear are not parallel. By reciprocating the gear the lapping action is spread across the fact. An adjustable hydraulic brake in the tailstock provides uniform load on the lapped surface, and the reversing switch permits lapping on both sides of the teeth.

Grinding Machines

Grinder, Centerless

Cincinnati Grinders Incorporated, Cincinnati, Ohio. [Vol. 75,p.577.] 177.

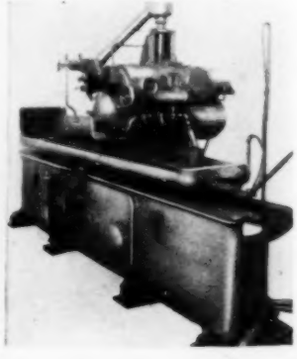
A modified centerless grinder for finishing four reliefs on pistons at a fast production rate has been developed. A special work-holding and driving unit replaces the regulating wheel housing and upper and lower slides of the Cincinnati No. 2 Centerless Grinder. With a 0.003-in. stock removal, five pis-

tons are relieved per min. The machine can also be applied to cam-shaped work.

Grinder, Surface, Open-Side, Improved, 15x15-In.

Norton Co., Worcester, Mass. [Vol.75,p.361.] 80.

The feature of this model is the design of the grinding wheel slide. The rear portion of the



slide is cylindrical in shape and bored to receive a standard motor field, which is pressed into place. The wheel spindle carries a standard rotor which runs in the stator with proper clearance. This arrangement eliminates several transmission elements, gives more applied power and reduces vibration. A 30 to 1 double-worm reduction gear for the table drive, and a motor-driven "Fulflo" pump unit for the grinding lubricant are also provided. The machine mounts a 14x6x5 in. grinding wheel and is built in 6-, 8- and 10-ft. lengths.

Grinder, Surface, Precision, 16-In.

Mattison Machine Works, Rockford, Ill. [Vol.75,p.499.]

Built-in motor drive for the spindle, hydraulic table feed, hydraulic wheel cross feed, power elevation of the wheelhead, and extra heavy construction are

features of this high-powered precision surface grinder. By mounting the motor rotor directly on the wheel spindle, it can be balanced as a unit so that no vibration is imparted to the wheel and full power is delivered. The machine is designed for use with a grinding wheel 14 in. in diameter with a 6-in. face by 5-in. hole.

Table speeds range from 30 to 90 ft. per min. Working surface of the table is 16 in. wide by 6, 7, 8, 10 or 12 ft. long, as required. Wheelhead adjustment is such as to allow 17 in. in the clear. Feed is adjustable from ¼ to 2 in. at each reversal of the table. Downward movement of the wheel is controlled by a separate "inching" pushbutton.

Grinder, Surface, Hydraulic

Thompson Grinder Co., Springfield, Ohio. [Vol.75,p. 717.] 272.

Fully hydraulic operation is featured in the 12x16x40-in. surface grinder. The table is actuated by a hydraulic cylinder and may be reversed either by table dogs or manually at any point of its stroke. The wheelhead is traversed hydraulically at both ends of the table reverse. Cross feed to the head is hydraulically actuated and is automatic in operation, acting at both ends of the stroke. Feeds from ⅛ to 2 in. per reverse are obtainable. A precision balanced rotor is keyed directly to the spindle, thus eliminating

vibration. The table has an infinite speed range from 20 to 100 ft. per min.

Grinder, Internal, Vertical, Model MV 500

Hutto Engineering Co., Inc., 515 Lycaste Ave., Detroit, Mich. [Vol.75,p.429.] 142.

For finish-grinding of heavy work, such as large truck, airplane and marine motor cylinders, Diesel engines, and air compressor cylinders, the Model MV 500 has a range for bores from 1½ in. to 8 in. by up to

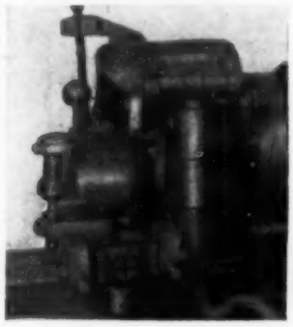
15½ in. in length. With the use of special Hutto grinders, bores up to 18 in. long may be ground. Four reciprocating speeds and two rotating speeds are provided. The driving spindle is telescoped to permit extraction of the grinder from the bore without disturbing the set-up.

Attachments for Internal Grinders

Heald Machine Co., Worcester, Mass. [Vol.75,p.433.] 130.

Wherever side-loading balloon-type fixtures are furnished, production suffers because of the increase in handling time due to opening and closing the chuck guard. Therefore, this company has developed an automatic chuck guard, applicable to all Heald No. 72A internal grinders. The operating means consists of a valve, a cam, and an oil cylinder on the guard back. When the table runs out to rest position, the valve is depressed by the cam, allowing the oil to exhaust from the cylinder and the springs to open the guard.

A neutral arrangement for



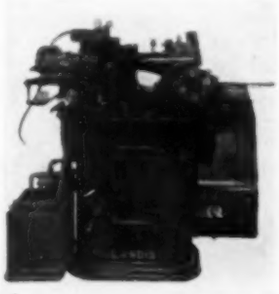
the workhead spindle has also been developed. The ability to free the workhead from its driving mechanism, so it can be turned by hand, is of value in setting up the machine, and is almost a necessity when balloon-type fixtures are employed.

Grinder, Ball-Race, Motor-Driven, 3-In.

Landis Tool Co., Waynesboro, Pa. [Vol.75,p.828.] 286.

The 3-in. ball-race grinder has been completely motorized and a sizing device has been added. As a result, the machine is adapted to grind outer ball-race grooves on a high production basis, and it may also be used to grind inner ball-race grooves.

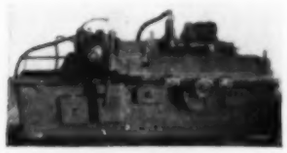
Operation of this machine is semi-automatic. After loading the work and swinging the sizing device around to its operating position, the wheel is moved into the work. The automatic wheel-feed mechanism advances the wheel a predetermined amount twice within the space of one oscillating movement. When the raceway is almost down to size, the wheel-feed mechanism is disengaged by means of a solenoid controlled by the sizing device. The remaining stock is removed without further feeding, and as soon as the raceway is to exact size the wheel moves back a few thousandths from the work.



Grinder, Cam, Automatic

Norton Co., Worcester, Mass. [Vol.75,p.609.] 212.

Automatic cam grinders for 36-, 42- and 48-in. camshafts have been developed. The various functions are performed automatically, most of them hydraulically. Solenoids operate the valve controlling the table movement and the work drive



clutch. As the table moves so that the first cam to be ground is opposite the grinding wheel, another clutch is engaged to start the grinding cycle. As the wheel-slide moves forward, the master cam roller is brought in contact with the correct master cam, and a table stop lever is tripped, positioning it for the next indexing of the table. Wheel truing and finish grinding follow automatically after all cams are rough ground.

Grinder, Cutter and Tool, Universal, No. 91

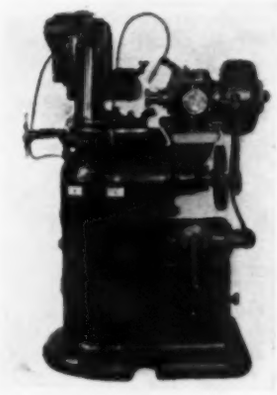
Covel Mfg. Co., Benton Harbor, Mich. [Vol.75,p.354.] 93.

The spindle-head will swing 110 deg. either to the right or left, so that any kind of cup

wheel grinding, as well as periphery grinding, can be done on either end of the spindle. Flat pads are machined on the top of the spindle-head for the purpose of clamping tooth rests and feed fingers.

The main table pivots in the center on the sub-table and will swing in either direction 180 deg. The spindle has three speeds, 3,200, 4,500 and 5,800 r.p.m., and is driven from the ball-bearing countershaft. The power table feed mechanism is powered by a ¼-hp. inclosed motor, driving the gearbox through V-belts. It is possible to have eight table speeds.

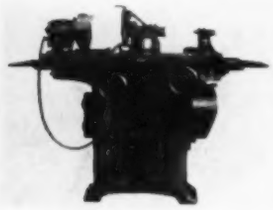
Specifications are: Longitudinal table movement, 20 in.; vertical movement, 11 in.; transverse movement, 8 in.; between centers, 10⅜x28 in.; working surface of table, 5½x40 in.



Grinder, Tool and Cutter, 12 x 32-In., Type B

Landis Tool Co., Waynesboro, Pa. [Vol.75,p.935] 325.

Plain and universal Type B tool and cutter grinders have the traverse motor mounted within the bed at the right, and three traverse speeds are secured by shifting a belt. Water pump drive is also taken



from this motor when the wet grinding attachment is supplied. The grinding wheel is driven by a motor mounted on the lower end of the column. Reversing the two-step motor pulley gives a second grinding wheel speed.

The wheel-head may be swiveled 90 deg. in either direction, and a grinding wheel up to 8 in. is supplied. The work-head may be swiveled in either a vertical or horizontal plane, or may be used for dead spindle or live spindle grinding.

Grinder, Cutter, Helical-Gear

National Tool Co., Cleveland, Ohio. [Vol.75,p.899.] 331.

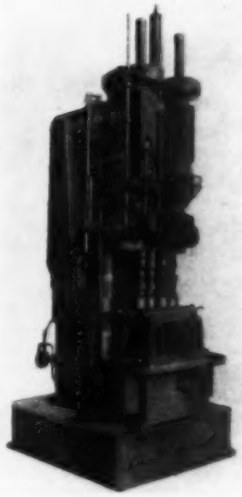
This grinder has been adapted for producing a radial helicoid cutting face on staggered-tooth helical gear-shaper cutters, both right and left hand. It is self-contained and fully automatic, except for loading. A vertical slide carries the grinding wheel directly to the helix angle of the cutter. An automatic index head identical with that used on National - Cleveland gear grinders has been provided for this unit.

Rotary and linear movement necessary in sharpening are combined in the cutter. Rotary movement results from a crank disk. A connecting rod transmits the reciprocating motion to the outer portion of the automatic indexing head, giving it a rotary oscillating movement. Helical guides fastened to the outer sleeve of the work spindle provide linear movement of the work.

Honing Machine, Multiple-Cylinder, Hydraulic,

Barnes Drill Co., 814-830 Chestnut St., Rockford, Ill. [Vol.75,p.644.] 203.

In the No. 214 hydraulic honing machine, fixed or adjustable-center-auxiliary heads can be supplied for 4-, 6-, or 8-cylinder honing. Each of the two driving spindles drives one-half of



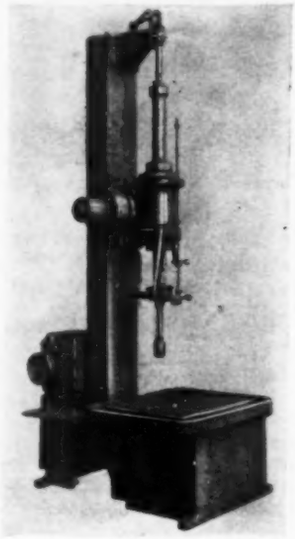
the number of auxiliary spindles.

The Oilgear pump is mounted in the column. A filtering system and reservoir for the coolant are also built in. The clutch lever engages the multiple disk clutch and opens the hydraulic valve, thus simultaneously starting the rotation of the two spindles and the reciprocation of the head.

Lapping Machine, No. 13

Moline Tool Co., Moline, Ill. [Vol.75,p.538.] 150.

Fabricated steel construction is employed in the No. 13 lapping machine. Power can be taken from the lineshaft or motor direct to the driving pulley, which incorporates a clutch. Power is transmitted from the mainshaft to a worm shaft through speed - changing slip gears. The spindle is also the hydraulic cylinder and is the

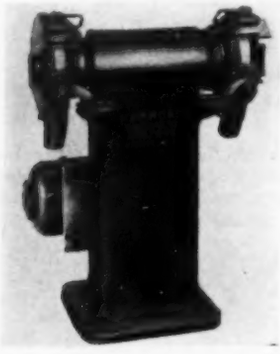


only reciprocating member. The tubular piston rod is held stationary by a bracket at the top of the column. Stroke is adjustable to 24 in.

Grinder, Floorstand, Multi V-Belt

Hammond Machinery Builders, Inc., Kalamazoo, Mich. [Vol. 75,p.398.] 120.

Power is transmitted from the motor to the spindle by means of Multi V-belts. As a result the spindle housing is of



small diameter, allowing more clearance between the grinding wheel and the spindle housing. The grinder can be supplied with 10, 12, 14 or 16-in. wheels and in 1, 2, 3 and 5-hp. sizes.

Grinders, Floorstand, Wide-Swing

Hisey-Wolf Machine Co., Cincinnati, Ohio. [Vol.75, p.977] 347.

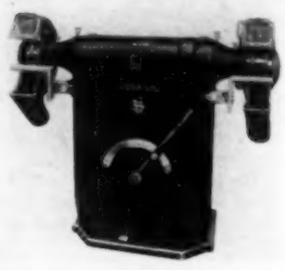
Wide-swing floor-stand grinders, which are particularly suitable for grinding large and

irregular shaped pieces, are made in 2½- and 3½-hp. sizes, and are equipped with four ball bearings mounted in the end caps in close proximity to the wheels. Timken roller bearings are optional equipment for the spindle bearings.

Grinder, Floorstand, Variable-Speed

United States Electrical Tool Co., Dept. 44, 2489 West Sixth St., Cincinnati, Ohio. [Vol.75, p.758] 276.

This Model 64 small grinder maintains a constant wheel surface speed regardless of wheel wear by means of the patented



Gibbs V-disk transmission. Ball bearings are used throughout. Other features are the chrome-manganese motor shaft and wheel spindle, adjustable cast steel wheel guards, and conveniently located push-button control with no-voltage release.

Grinder, Snagging, Heavy-Duty

Hisey - Wolf Machine Co., Cincinnati, Ohio. [Vol.75,p. 649.] 246.

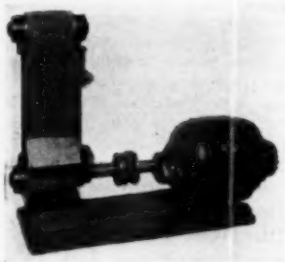
Independent speed control for each wheel is a feature of this heavy-duty snagging grinder, which is manufactured for 20-,

24-, and 30-in. grinding wheels, either high-speed or vitrified, with spindle speeds to correspond. Ball bearings or Timken roller bearings are optional equipment.

Grinder, Abrasive-Belt

Coats Machine Tool Co., Inc., 110 West 40th St., New York, N. Y. [Vol.75,p.678.]

Seven sizes of an abrasive belt grinder have been placed on the market. In this machine either horizontal or vertical positions of the belt can be se-

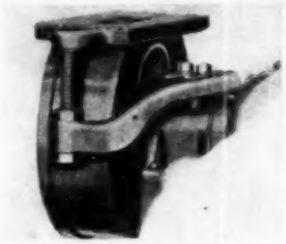


cured. A track regulating device permits tilting or tipping the drum toward or away from the horizontal line. Belt-drive from any direction is possible.

Grinding Attachment, Surface

Hisey-Wolf Machine Co., Cincinnati, Ohio. [Vol.75,p. 324.] 86.

This surface grinding attachment is interchangeable with standard wheel guard equipment, and can be mounted on either the right or left side of



the machine. The table is adjusted to wheel wear by two square-thread screws. The guard cover is readily removable.

Infeed Unit, Semi-Automatic

Cincinnati Grinders Incorporated, Cincinnati, Ohio. [Vol. 75,p.358.] 107.

For rough and finish grinding of cylindrical shafts having multiple diameters, this unit is electrically and hydraulically controlled. It is located on the bed, directly at the rear of the wheelhead. Positioned in the rear of the unit is a flat master cam made up of a series of steps, each step corresponding

to a diameter on the work being ground. The rear unit also contains six solenoid stops, which act to control the longitudinal travel of the master cam.

A star control wheel at the front is indexed by station dogs as the table is hand traversed, and actuates the solenoid stops in turn. Limits of plus or minus 0.002 in. are held on all diameters. All types of multiple-diameter work with no greater diameter variation than 2 in. between the several diameters can be ground with the unit.

Grinder, Lathe

United States Electrical Tool Co., Dept. 44, 2489 West Sixth St., Cincinnati, Ohio. [Vol. 75,p.719.] 275.

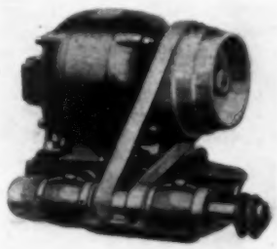
Built for lathes having swings of 9 in. and up and also having a compound rest, this lathe grinder is used especially for

grinding centers, reamers, dies, rolls, small shafts and similar work. It can also be used on shapers, planers and boring mills. The motor is ¾ hp. and has a speed of 5,200 r.p.m.

Grinder, Lathe, Improved

Layth-Grindar Corp., 28 Canfield St., Orange, N. J. [Vol. 75,p.793.] 281.

A three-step cone pulley now gives three spindle speeds. Two additional speeds can be had by reversing the spindle pulleys.



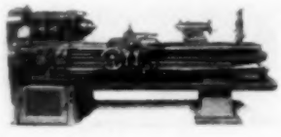
Two advantages result from this change. First, it is easier to get the most nearly correct cutting speed from a wheel of a given diameter. Second, longer wear can be had. This three-step pulley is furnished only on the ½-hp., ¾-hp. and the two ¼-hp. engine lathe sizes.

Lathes

Lathe with Roller-Bearing Spindle

Lodge & Shipley Machine Tool Co., Cincinnati, Ohio. [Vol.75,p.501.] 95.

In addition to its regular line of lathes with plain white-metal spindle bearings, the company is building selective-head engine lathes with a roller bearing spindle mounting. Three roller bearings are used, two "Zero Type" Timken tapered roller bearings on the front and one



Norma Hoffmann roller bearing on the rear. The two front bearings are opposed and the thrust in either direction is taken by them. The straight roller bearing on the rear leaves the spindle free for endwise movement when making adjustments.

Lathes, Engine, Heavy-Duty, 30- and 36-In., "Tritol"

Joseph T. Ryerson & Son, Inc., Chicago, Ill. [Vol.75,p. 251.] 49.

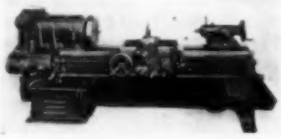
Among the features of these lathes are: direct-reading 16-

speed control; totally inclosed, anti-friction, self-oiling gearbox; anti-friction end gearing, and anti-friction centrally oiled apron. The headstock is of full herringbone-gear design and operates on anti-friction bearings. The spindle and all drive shafts are alloy steel forgings.

Lathes, Engine, Sliding-Gear Head, 16-Speed

Reed-Prentice Corp., Worcester, Mass. [Vol.75,p.1014]

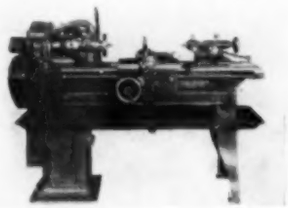
This line of 16-speed lathes in 14, 16, 18-in. heavy and 20-in. sizes has a new quick change gear mechanism that provides all thread and feed changes without the use of pick-off gears. These features are also now standard equipment on 8-speed lathes of comparable sizes. The use of the four-bearing spindle mounting with precision Timken taper roller bearings has been retained.



Lathe, Engine, High-Speed, Precision, 12-In.

Hendey Machine Co., Torrington, Conn. [Vol.75,p.977] 368.

This lathe gives fine finish through fine feeds at high work speeds with a result that approaches lapping quality. Needle valves, or similar parts re-



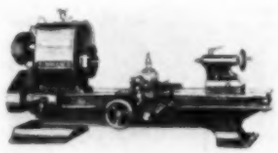
quiring a precision taper fit, can be turned with both feeds engaged.

The spindle runs in precision preloaded ball bearings, both front and rear. Normal spindle with a four-step cone are 455, 775, 1,200 and 2,000 r.p.m. The feeds, both longitudinal and cross, approximate 1,600 per in. or 0.000625 in. per revolution of the spindle. Collets with a maximum capacity of ⅝ in. can be furnished.

Lathes, Engine, Models B & C, Schaffner

General Radial Drill Co., 1767 Elmore St., Cincinnati, Ohio. [Vol.75,p.430.] 135.

The Model "B" manual-training machine is of 11½-in. swing and is made in 4-, 5- and 5½-ft. bed lengths in either the bench or floor type. Inclosed head design is employed. The motor



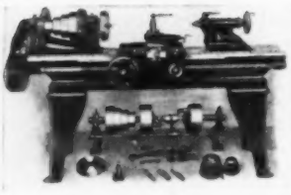
is built in and drives the back cone, this cone in turn driving the spindle cone through a Gibbs disk mounted as an idler between these cones.

The Model "C" lathe for woodworking has a swing over the bed of 12 in. and the bed lengths available are 4, 5, 5½ and 6 ft. Six spindle speeds range from 600 to 3,000 or from 400 to 3,400 r.p.m.

Lathe, Engine, 16-In., Junior

South Bend Lathe Works, South Bend, Ind. [Vol.75,p. 903.] 328.

The bed lengths available are from 6 to 12 ft. The lathe has been relieved of non-essential, expensive features not needed in general machine shop work. It is a back-geared, screw cutting type with automatic longitudinal

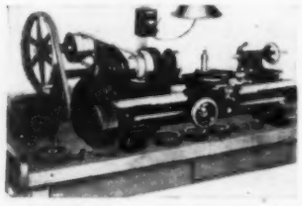


feed and eight changes of spindle speed. All standard screw threads may be cut. Bearings are of phosphor bronze and are adjustable for wear. The tailstock has a set-over.

Lathe, Engine, Junior, 8-In.

South Bend Lathe Works, South Bend, Ind. [Vol.75, p.1013] 370.

This precision lathe is available in countershaft and individual motor-drive styles. Six changes of spindle speeds are provided. Features are: hollow spindle of alloy steel; Acme



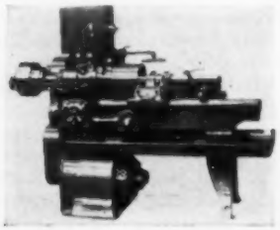
precision leadscrew; automatic longitudinal feed to the carriage; tailstock sets over for taper turning, and threads from 4 to 40 per in. may be cut. Bed lengths supplied are 24, 30, 36 and 42 in.

Lathe, Automatic, for Facing and Forming

R. K. LeBlond Machine Tool Co., Cincinnati, Ohio. [Vol.75, p.355.] 101.

Intended for rough and finish facing or rough and finishing forming operations, the machine is so constructed that a wide variation of feeds may be instantly obtained by merely shifting two levers. Feed is transmitted from the feed box to the bevel gear drive shaft, which in turn drives the cam drum. The cam acts directly on a roller mounted on the lower side of the cross-slide, eliminating lost motion and inaccuracy.

The machine is entirely automatic. The rough-forming cut is taken at a suitable feed and the tool slide is traversed for the finish form tools. At this point, a cam actuates a switch

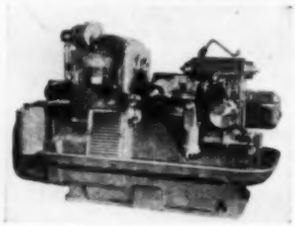


which shunts out part of the resistance in the shunt-field circuit of the driving motor and thus reduces the spindle speed. This machine has a six-speed, Timken-equipped geared head and spindle speeds up to 1,000 r.p.m.

Lathe, Automatic, No. 8

John S. Barnes Corp., Rockford, Ill. [Vol.75,p.1006] 354.

Multi-range hydraulic feed, multiple V-belt drive direct from the motor to the main spindle and a variable-speed motor drive controlled automatically through the hydraulic circuit without the use of a clutch are the outstanding features of the No. 8 automatic lathe. The spindle rotates clockwise, and the front and rear tool carriages are de-

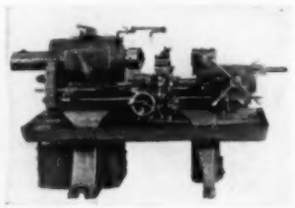


signed to put the full load on the lathe bed. From the main spindle are driven the two variable-delivery feed pumps. With this arrangement no valves are required in the feed circuits of the front and rear carriages, the feed per revolution following variations in spindle speed.

Lathe, Turret, Universal, No. 3

Warner & Swasey Co., 5701 Carnegie Ave., Cleveland, Ohio. [Vol.75,p.1007] 356.

Bar capacity of 1½ in. and maximum swing of 15¾ in. are embodied in the No. 3 universal turret lathe. Six spindle speeds range from 67 to 740 r.p.m. The spindle is mounted on double Timken roller bearings. Automatic indexing, with an auto-



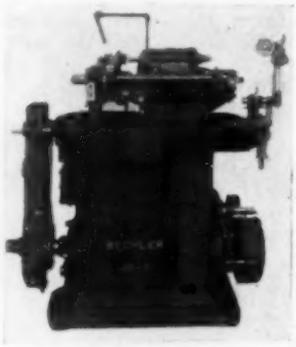
matic turret binding mechanism, increases the convenience of operating the turret. Six power feeds are provided.

The universal carriage is equipped with a quick indexing square turret, and is provided with six power cross and longitudinal feeds. The cross-slide carriage stop roll has six stop screws which make possible the cutting of more than one diameter with one tool in the square turret.

Screw Machine, Automatic, High-Precision, Bechler

Triplex Machine Tool Corp., 50 Church St., New York, N. Y. [Vol.75,p.542.] 174.

This unit is particularly suitable for the production of small and medium-size accurate parts, such as electrical products, precision instruments, gages,



cameras, and clocks. Long and complicated pieces are produced without a second operation to an accuracy of 0.00025 in. for both diameter and length, by means of a double micrometer adjustment on all tools. More than 30 attachments can be furnished. Three sizes are available: ⅛-in., ¼-in. and ⅜-in. bar capacity by 2¾-in. working length. Combined movements of headstock and tools permit a wide variety of pieces to be made.

Nut Tapping Attachment for Screw Machines

Brown & Sharpe Mfg. Co., Providence, R. I. [Vol.75,p.255.] 41.

This second-operation attachment is made in three sizes for use on the Nos. 00, 0 and 2 machines, both the regular and high-speed types, and also on the screw threading machines. It is fastened to the machine above the front cross-slide.

A transporting arm takes the

part after it has been cut off at the main spindle of the machine, carries it to an intermediate position where a countersinking operation is done on the back end, and then to the tapping unit proper. Here the nut is placed in a revolving chuck and automatically fed over a bent shank tap.

Spherical Turning Attachment for Lathes

R. K. LeBlond Machine Tool Co., Cincinnati, Ohio. [Vol. 75,p.543.] 183.

For rough and finish turning of spherical surfaces, this attachment features rigidity, centralized control, ease of setup, and a large size range. The attachment is supported on heavy-plate-type carriage. The

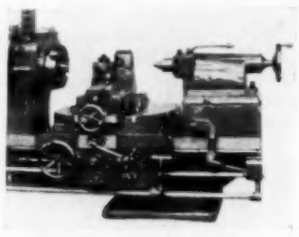


plate is revolved by a worm gear drive with a reduction ratio of 160 to 1.

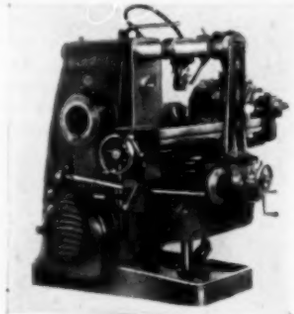
The handwheel *D* feeds both front and rear tools into the work. Lever *N* actuates the clutch and handle *P* is used to change the direction of feed. Motor speed variations are obtained by the handle *K*. Final adjustment for the front finish turning tool can be made by the top slide screw *S* without moving the rear tool.

Milling Machines

Milling Machines, Knee-Type, "Milwaukee", Nos. 1 and 2

Kearney & Trecker Corporation, Milwaukee, Wis. [Vol. 75,p.184.] 37.

Outstanding features of these machines include: a greatly broadened range of spindle speeds from 15 to 1,500 r.p.m. in 27 steps; feeds from ¼ to 60 in. in 27 steps; a center-bearing spindle with worm drive; a sponson-type knee; a stabilized column, and multiple V-belt drive. The horizontal type is offered in three models—universal, plain, and manufacturing; and the sliding-head vertical type in two models—plain and manufacturing. These machines are suited for use with



tungsten and tantalum-carbide milling cutters.

The 27 speeds are obtained by a single lever in combination with a large direct-reading dial. The spindle itself is carried on three bearings, which makes for a much stiffer arrangement. The feed lever and dial are on the front of the knee. The center arbor support is made in two hinged halves, each bored to fit over one overarm. They are accurately locked together, making possible removal of the arbor with its cutters assembled.

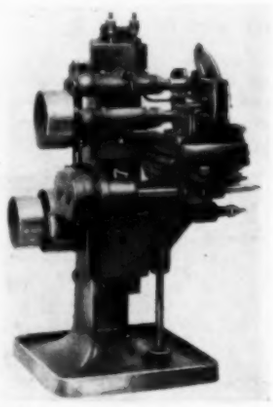
All models are provided with rapid traverse in six directions, for the table, 150 in. per min.; for the knee and saddle, 75 in. per min. Operating handles are placed in the most natural position for the operator.

The dividing head divides all numbers to 500 and provides over 40,000 leads ranging from 38 threads per in. up to 240 ft. per turn. Circular milling can be done, since the dividing head spindle can be rotated by power without engagement of the table screw.

Milling Machine, Double-Spindle, Automatic

Superior Machine & Engineering Co., 1930 Ferry Park, Detroit, Mich. [Vol.75,p.37.] 1.

The work is clamped and unclamped by movement of the table. Table dwell can be regulated. In addition, the table can be disengaged and operated by

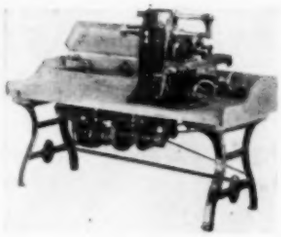


hand when setting up. This type of machine allows various fixtures to be used. Spindle speeds are changed by means of pulleys, and the feed of the table through change gears. The machine can be belted direct from the main lineshaft or driven by a motor. It is also made with a single spindle.

Milling Machine, Bench, Motor-Driven

Hardinge Brothers, Inc., Chicago, Ill. [Vol.75,p.190.] 22.

The No. 5 bench-type milling machine is driven by a V-belt, under-bench transmission. Six speeds range from 160 to 1,400

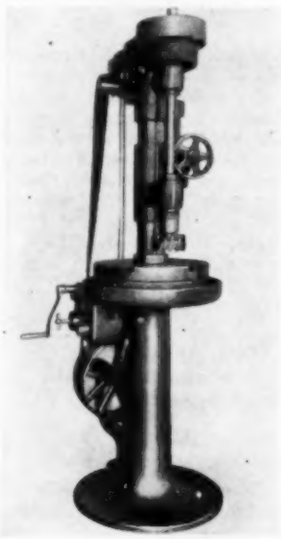


r.p.m., forward or reverse. Specifications: Collet capacity, 1 in.; diameter of arbor, ½ or 1 in.; working surface for table, 20x6 in.; movement of table: longitudinal, 1 in.; transverse and vertically, both 6½ in.; maximum capacity of swivel vise, 2½ in.

Milling Machine, Vertical, Continuous

E. W. Bemis Machine Co., Worcester, Mass. [Vol.75,p. 647.] 224.

This small continuous milling machine is driven from a countershaft. The work table is 17½ in. in diameter and revolves around the post on ½-in. balls.



It is driven by a worm at four speeds through means of the gearbox. The spindle has two speeds, is large, and runs in a tapered bronze bearing. It carries a 5-in. milling cutter. The greatest distance from the cutter to the table is 5¾ in.

Milling Machine, No. 11

Van Norman Machine Tool Co., Springfield, Mass. [Vol. 75,p.505.] 156.

The No. 11 supersedes the No. 10 and the No. ½ small milling machines. The motor is mounted in the base and is aligned for roller chain drive by means of an adjusting plate.

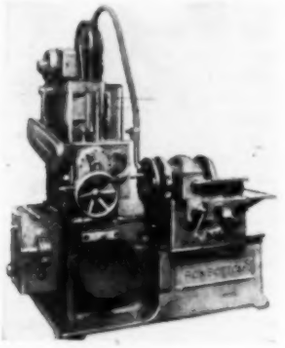
Specifications: ram movement, 8 in.; saddle cross feed, 6½ in.; power traverse feed, 16 in.; vertical range from center

line of arbor in horizontal position to top of table is lowest position, 15 in.

Milling Machine, Cam, Model 300

Rowbottom Machine Co., Waterbury, Conn. [Vol.75,p. 321.] 74.

This machine uses the former-follower system, with formers made from cast-iron plates ½ in. thick. The capacity is: box cams up to 32 in. outside diameter, face cams up to 28 in. and barrel cams up to 24 in.,



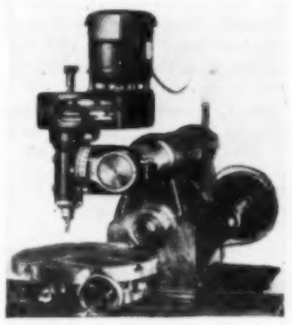
with a travel, or throw, up to 12 in. The machine is driven by a 3-hp. motor, belted to a swinging gearbox, from which the cutter spindle and workhead drives are separated.

The workhead is rotated on trunnions to bring the axis of the work spindle either in a vertical or horizontal position. The former spindle is positively driven through worm and wormwheel by the back shaft, which is connected with the feed by a starting clutch lever.

Milling Attachment, High-Speed

Bridgeport Pattern & Model Works, 50 Remer St., Bridgeport, Conn. [Vol.75,p.935] 312.

This high-speed milling attachment for milling machines is of value in building dies for



Bakelite, hard rubber, glass, die casting, or blanking and forming. It is designed to swivel 360 deg. both ways, and is a self-contained power unit.

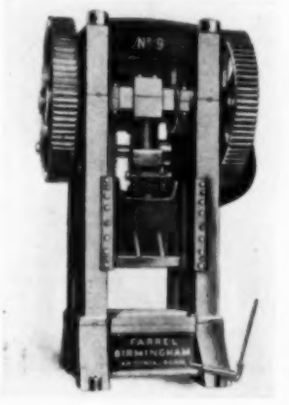
The spindle takes draw-in collets with a 7/16 in. maximum capacity. The spindle is mounted on four SKF preloaded ball bearings. Speeds of 500, 1,300, 3,500 and 5,000 r.p.m. are provided.

Presses

Presses, Power, Improved

Farrel-Birmingham Co., Inc., Ansonia, Conn. [Vol.75,p.38.] 4.

The presses now incorporate anti-friction bearings on the

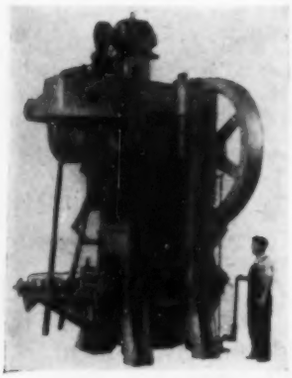


drive shaft of all geared models. A multiple-disk friction clutch with magnetic control and magnetic brake is provided, together with push-button control with start and stop buttons for one or more operators and at as many points as necessary. A selector switch and inching control enable the operator to run the press continuously, a stroke at a time, or to inch the press under control for special working conditions or for setting dies.

Press, Single-Crank, No. 512

Niagara Machine & Tool Works, Buffalo, N. Y. [Vol. 75,p.219.] 40.

A large single-crank press, equipped with a special two-increment roll feed, has been developed. Specifications for this press required the punching of



a predetermined number of groups of holes in strip stock, the distance between the groups to be uniform, but the space between the last group and the end of the sheet to be greater. This necessitated, after the last stroke, an automatic change in the feed from the standard increment to a longer one. The press is single geared and operates at 42 strokes per min.

Press, Crank, Four-Point Suspension

E. W. Bliss Co., 53rd St. & Second Ave., Brooklyn, N. Y. [Vol.75,p.536.] 164.

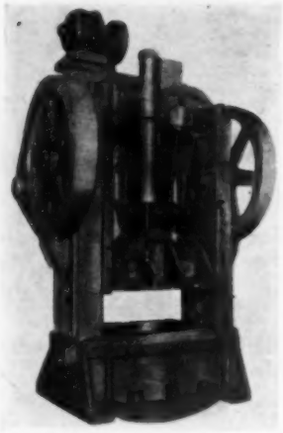
This four-crank press (four-point suspension), has two double crankshafts, which, geared together to revolve in step, distribute the pressure of the four pitmans to the four corners of the slide. This is important on large automotive body dies. Bed area of this

press is 70x150 in. The crown has a cored box section with a vertical web over each shaft. Each shaft thus has its own beam, which is stiffened by connecting flanges and diaphragms. The pitmans are "solid" and non-adjustable. Slide adjustment is effected through four screws attached to the slidable wrist blocks. The nuts for the screws are geared to an adjusting motor on the slide.

Press, Double-Crank, Electrically Controlled

Niagara Machine & Tool Works, Buffalo, N. Y. [Vol. 75, p.866] 318.

This press has an electromagnetic clutch and brake operating in conjunction. Push-button control of the slide motion is so arranged that four different methods of operation may be selected and the control may be locked. The clutch is of the multiple-disk type, engaging gradually to permit smooth acceleration. The elec-

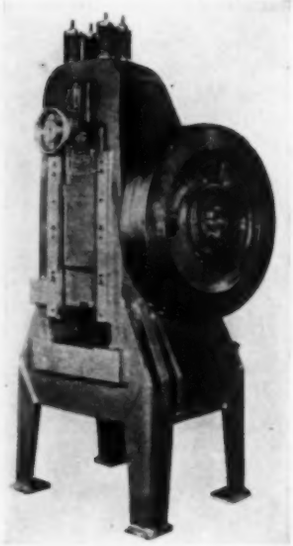


tro-magnetic brake is automatically released when the clutch is engaged, and instantly applied when the clutch is disengaged.

Presses, All-Steel

Henry & Wright Mfg. Co., Hartford, Conn. [Vol.7,p.937]

In addition to the inclinable and single-crank, straight-sides types [*AM*—Vol.74,page701] the line now includes double-crank straight-sided presses, horning types, straight-sided knuckle joint presses, double-crank overhanging gap-frame presses, as well as special models. Practically all of the single-crank, double-crank and knuckle-joint presses are made in the shrunk-in tie rod construction, although a number of these presses have been built with solid frames where special tooling or other conditions warranted. The 200-ton knuckle-joint press illustrated is of the solid frame type in order to keep the right to left overall dimension to a



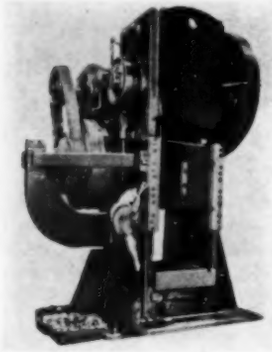
minimum for the required die space.

The company is also furnishing welded steel frames for all types of presses to replace broken cast-iron frames.

Press, Forging, No. 12B, Verson

Allsteel Press Co., 12015 Peoria St., Chicago, Ill. [Vol. 75,p.615.] 225.

This No. 12B Verson "All-Steel" forging press, made in capacities up to 500 tons, is intended for hot pressing, buttoning, sizing, or coining and pressure finishing in one operation.



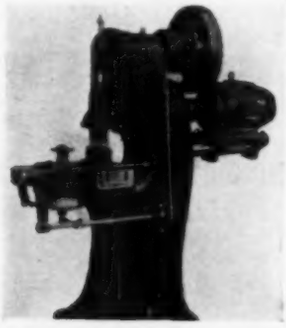
Arc-welded steel plate construction is used.

Crankshafts are nickel-chrome-molybdenum forgings. The ram incorporates a saddle and sliding wedge to relieve the wrist pin of the blow and to distribute it. Main, eccentric, and pin bearings are bronze bushed and the steel gibs are bronze faced. Roller bearings are used elsewhere. V-belt drives are standard.

Press, Armature-Notching, Automatic, High-Speed

Schatz Mfg. Co., Poughkeepsie, N. Y. [Vol.75,p.831] 303.

These three machines will take disks of 29½, 39 and 59 in. in diameter, and have an operating speed up to 650 strokes per min. The table, on which the

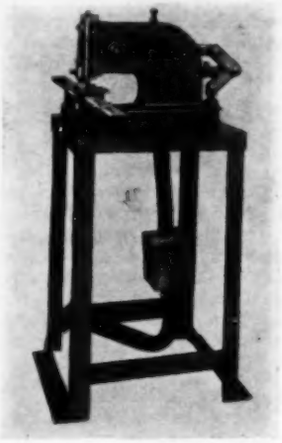


indexing mechanism is mounted, is an integral part of the frame. The circulating oil system is built inside the frame. An attachment can be provided for notching stators as well as rotors.

Press, Foot, Toggle-Lever, No. 28

Whitney Metal Tool Co., 110-114 Forbes St., Rockford, Ill. [Vol.75,p.189.] 26.

Capacity for punching a 2-in. hole in 16-gage sheet is embodied. Throat depth is 7 in., height of throat, 4 in.; slug clearance hole, 2¼x4¼ in., and

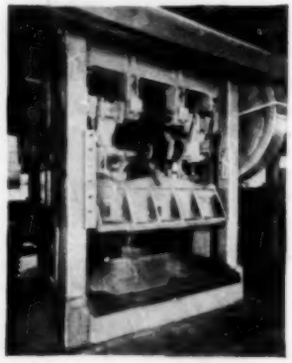


stroke, 1 in. The ram connections are adjustable. The adjustable pedal has six laminated plates to take up wear. A bolster-plate type die holder is provided. Speed of operation is 100 holes per min.

Press, Trying-Out, Double-Crank, Reversible

Williams, White & Co., Moline, Ill. [Vol.75,p.37.] 2.

For use in die shops for trying out dies, this straight-side, double-crank, double-geared tie-rod press is of the reversible type. Two friction clutches,

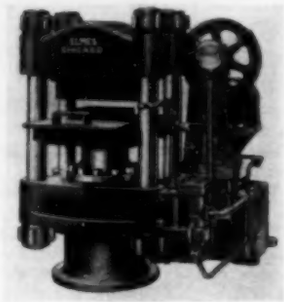


one forward and one reverse, are mounted on the flywheel shaft. The press operates at a speed of 17 strokes per min.

Press, Hydraulic, with Automatic Control

Chas. F. Elmes Engineering Works, Morgan & Fulton Sts., Chicago, Ill. [Vol.75,p.720.]

The No. 3544 hydraulic press is equipped with an automatic control and a vertical two-pres-

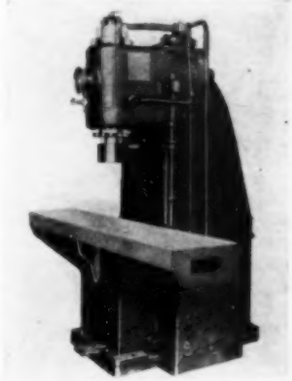


sure pump. The operator simply has to depress the starting lever and the press ram moves upward, automatically bypassing the low pressure at the proper time, and then automatically reversing the press after the required pressure has been exerted. An adjustment allows the press to function so that the low pressure bypasses automatically as before and then the press reverses after the ram has traveled a specified distance.

Presses, Gap, Assembling, Oil-Pressure

Hydraulic Press Mfg. Co., Mount Gilead, Ohio. [Vol.75, p.718.] 240.

The assembling press is of the open-gap type to provide easy access to the work. The operating system consists of a

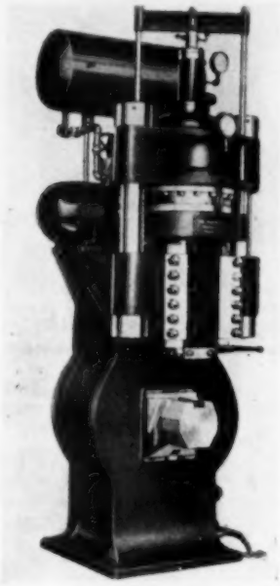


rotary type, low-pressure oil pump which advances the ram to the work rapidly, and a radial-type, high-pressure oil pump for generating the full working pressure. Both pumps are driven from one motor. Seven capacities range from 15 to 200 tons, with either square or extended beds.

Presses, Hydraulic, High-Speed

French Oil Mill Machinery Co., Piqua, Ohio. [Vol.75,p. 682.] 264.

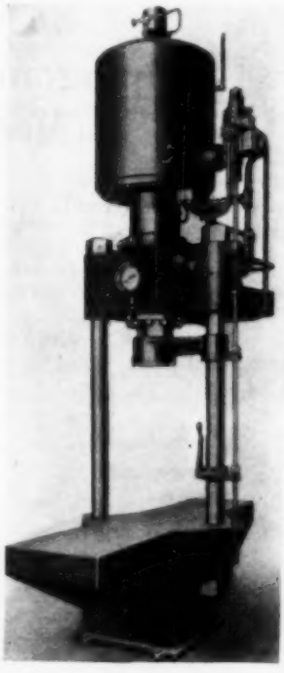
Hydraulic presses in horning and column types, and with columns inclosed in large housings for gib guiding of the moving platen, are available. Operation is by a pedal or hand lever, the latter also acting as an emergency release. The unit can be set to operate at any desired stroke or pressure, and when the latter is reached the press will reverse instantaneously to open position, or it can be set to hold the desired pressure for any desired period and then return automatically.



Presses, Hydraulic, Two-Rod, "H-P-M"

Hydraulic Press Mfg. Co., Mt. Gilead, Ohio. [Vol.75, p.941] 273.

Designed for straightening and assembling operations, the two - rod "Hydro - Power" presses with square and extended beds differ from the open-gap type [*AM*—Vol.75, p.718] only in the frame arrangement and not in the operating system. The press



frame is arranged vertically with the pressing plunger acting downward. Thus, the work remains stationary on the lower bed. Two heavy steel strain rods provide for rigidity. The head yoke is mounted on the shoulders of the two strain rods, and the two strain rod nuts are screwed into position. The head yoke holds the cylinder and the oil tank. These two-rod presses are available in six capacities from 25 to 200 tons.

Presses, Hydraulic, Vertical, Sideplate-Type

Oilgear Co., 1301-1417 W. Bruce St., Milwaukee, Wis. [Vol.75,p.976] 363.

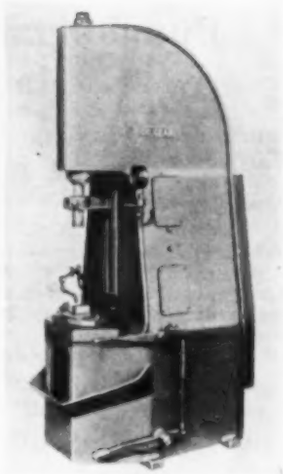
Broaching and general manufacturing operations can be carried out on the all-steel, sideplate-type vertical presses. Only 28x45 in. of floor space is required. The heavy one-piece welded steel structure provides

rigidity and alignment. The operating mechanism includes the Oilgear Type RSA constant-displacement pump, electric motor and drive, lubricant pump, tubing and control. Hand and pedal controls with adjustable stroke limit stops are standard. Three sizes are 8, 10 and 12 tons, all having strokes adjustable from 6 to 27 in. In all cases the throat is 8 in., and the width between sideplates is 20½ in.

Presses, Hydraulic, "Streamline"

Oilgear Co., 1301-1417 W. Bruce St., Milwaukee, Wis. [Vol.75,p.612.] 216.

The presses may be equipped with either variable-delivery, constant-pressure or constant-



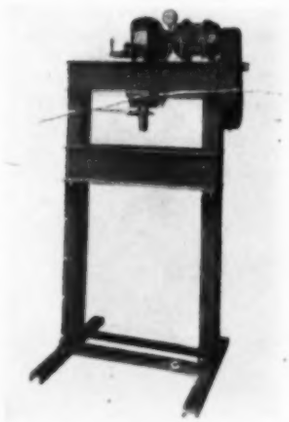
displacement Oilgear pumps and suitable controls. Thus, satisfactory operating characteristics are available as best adapted for assembling, broaching, forging and general manufacturing.

The press frame is a one-piece heavy welded steel structure. Both a hand lever and a pedal with semi-automatic or full automatic controls are furnished as standard equipment with either type of pump. Presses are manufactured in the capacities of 2½, 3½, 6, 10, and 15 tons. General specifications are: stroke, 18 in.; "daylight," 24 in.; depth of throat, 8 in.; size of platen, 10x13 in.

Press, Hydraulic, Hannifin-Vickers

Hannifin Mfg. Co., 621 S. Kolmar Ave., Chicago, Ill. [Vol.75,p.757.] 283.

This hydraulic press is furnished in two types: hand-operated or motor-driven, and in



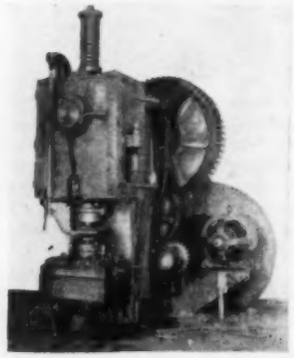
three sizes of 20-, 40- or 60-ton capacity. Cylinder, valve and reservoir are combined. The Vickers pump and control valve are used. The standard frame is so constructed that the motor drive can be added later. The press is offered for those special jobs that come up at frequent intervals and require the use of a powerful press.

Punching and Shearing Machines

Punch Press for Large Washers

Reading Iron Co., Reading, Pa. [Vol.75,p.504.] 152.

This fabricated heavy-duty washer punch press has a ram pressure of 525 tons. It is capable of cold-punching complete washers up to 6 in. outside diameter and 3 in. inside



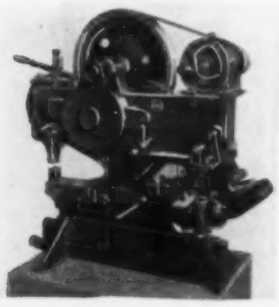
diameter, from rolled steel plate up to ⅝ in. in thickness.

The press is equipped with a mechanism which ejects the punched washers from the dies and places them on a throw-out arm. Power is provided by a 25-hp. motor arranged to give a final ram speed of 40 strokes per min. for small washers and 20 strokes for large washers.

Punch and Shear, Type MK-10

Henry Pels & Co., Inc., 90 West St., New York, N. Y. [Vol.75,p.392.] 91.

For use in light ornamental iron, automobile body, sign, or welding work, the Type MK-10 has capacities as follows: cuts angles and T's, square, 3x3x$\frac{5}{16}$ in.; on miter, 2x2x¼ in.; punches ¾-in. holes through ⅝-in. stock or ⅝-in. through ½-in. stock;



shears plates any length or width ⅜ in. thick, and copes and notches angles, 3x3x$\frac{5}{16}$ in. The machine will also cut rounds, squares and flats. The punch and shear ends can be used independently and simultaneously, so that two men can work on the machine at the same time. Legs of angles can be trimmed under the plate shear knives.

Depth of throat is 12 in. The unit has 35 strokes per min., with a 1⅜-in. stroke on the plate shear; ⅞-in. stroke on the bar and angle shear, and a punching stroke of $\frac{13}{16}$ in.

Punch and Shear, Vertical, Heavy-Duty, No. 12

Wickes Bros., Saginaw, Mich. [Vol.75,p.610.] 207.

For shearing 4½-in. round steel bars, 1½x16-in. flat steel and other structural shapes of equivalent area, the No. 12 heavy-duty vertical punch and shear has capacity of 500 tons applied pressure, a 5-in. stroke of the ram, and a 24-in. depth

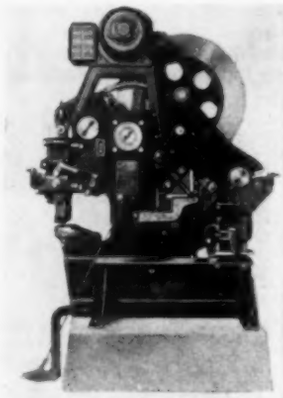
of throat. The main punch body is a steel casting. The ram is of steel with bronze bearing surfaces. It is provided with an adjustable counterweight for balancing the various tools attached. The clutch is provided with an adjustable automatic stop attachment.

Shear, Notcher and Coper

Buffalo Forge Co., Buffalo, N. Y. [Vol.75,p.222.] 44.

Seven distinct operations are now possible on the "Universal Iron Worker." These operations are punching, bar shearing, angle shearing, angle mitering, plate slitting, coping and notching. Both the notching and coping operations can be done without changing tools. One end of the machine has a built-in notcher, whereas the other end (shear end) permits the use of a coper or notcher interchangeably. For shops that use the punch more extensively than the bar-cutter and shear sections, the 90 deg. notching tools are now furnished on the shear end instead of on the punch head.

The machines are available in three sizes: No. 0, ½ and 1½, having punch capacities of ⅝x⅝ in., ⅞x⅞ in., and ⅞x1¼ in.



Shear, All-Steel, with Hydraulic Hold-Downs

Cincinnati Shaper Co., Elam St. & Garrard Ave., Cincinnati, Ohio. [Vol. 75,p.676.] 267.

Hydraulic hold-downs, a low rack or shear angle, main members of steel plate, the lowered drive shaft, the non-floating knife bar, and worm drive are features of the all-steel shear. The $\frac{3}{16}$ in. 10 and 12 ft. shears

operate at 60 strokes per min. Clamping pressure at each hydraulic hold-down is uniform regardless of variations in the thickness of the sheet. Through eccentrics the drive shaft pulls downward and backward on the knife bar by means of steel pitman links, to hold it securely against the hardened flat guide bearings. The two spring counterbalances pull backward as well as upward on the knife bar and perform the function of a brake. Drive from the motor to the flywheel is made by V-belt, and thence through a worm and wheel reduction unit to the main shaft.

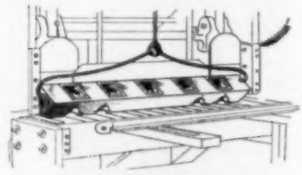
Shears are offered for 10 gage, $\frac{3}{16}$, ¼, ⅜ and ½ in. plate. Standard lengths are 6, 8, 10 and 12 ft.

The cam (Vol.75,p.829) on the end of the eccentric shaft of the shear actuates a piston which displaces the oil in the master cylinder, and forces the oil to the hold-down plungers. Each hold-down plunger delivers the same pressure regardless of its downward travel. If a sheet varies in thickness, the low points will be clamped with the same pressure as the high points. Each plunger delivers a maximum of 2,000 pounds pressure, and plungers are spaced at 3-ft. intervals.

Guard for Shears, Lighted

Surty Mfg. Co., Inc., 4139 Kinzie St., Chicago, Ill. [Vol. 75,p.757.] 278.

This electrically lighted guard is attached to the frame of the shear at each end and is set so as to leave from ¼- to ⅜-in. opening above the bed to permit passing of stock under the pressure bar and knife. Pockets are built into the guard and extend through the openings in the



pressure bar to within ¼ in. of the knife to permit the operator to hold narrow strips of stock close to the knife blade without danger.

Tapping and Threading Machines

Tapping Machine, Upright, Four-Head, Automatic, No. 2X

Western Machine Tool Works, Holland, Mich. [Vol.75,p.398.]

This Garvin No. 2X machine will tap holes of four different sizes rapidly. It is equipped

with the Garvin four-change, Timken-bearing-equipped speed box. One head is arranged for left-hand drive. Each head has a capacity for driving ¼- to ⅞-in. U.S.S. taps in cast iron, or from ¼- to ¾-in. in steel.

Tapping Machine, Upright, High-Speed

R. G. Haskins Co., 4636 W. Fulton St., Chicago, Ill. [Vol. 75,p.938] 345.

In this high-speed tapping machine control is by a treadle so arranged that the load on the tap is definitely limited no matter how suddenly pressure is applied. Tapping capacity is ¼ in. in brass and 3/16 in. in steel. The tapping head incorporates a highly sensitive reversing

mechanism. Collets are furnished to take taps from Nos. 2 to 14.

The machine is regularly furnished with change gears for any two of the following standard tapping speeds: 1,500, 1,750, 2,333 and 3,062 r.p.m. A plunger pump furnishes coolant to the taps. A pedestal base mounting or a bench mounting can be furnished.

Threading Machine, Pipe, Model A

Borden Co., Warren Ohio. [Vol.75,p.289.] 63.

Three opening dieheads are supplied, including ¼ by ¾ in., 1 by 1¼ in., and 1½ by 2 in. Dies are adjustable for over,

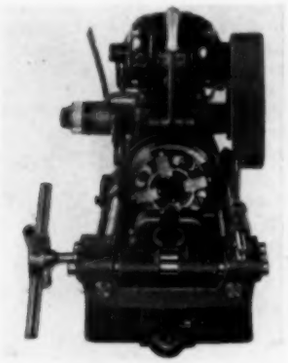
under or standard threads. It is not necessary to back off over finished threads.

The unit has a ½-hp. universal motor, reversible at the switch. The oil pump is mounted on the outside.

Threading Machine, Pipe and Bolt,

Oster Mfg. Co., Cleveland, Ohio, and Williams Tool Corp., Erie, Pa. [Vol.75,p.540.] 162.

The rotary diehead "Tom Thumb" unit has pipe capacity from ⅛ to 1¼ in., with an extra

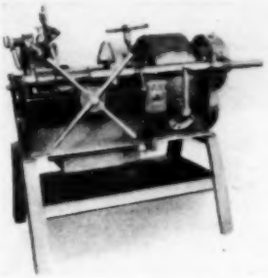


capacity down to and including ⅛ in. The regular bolt capacity is ⅜ in. to 1¼ in. with an extra capacity of ½, ⅝, 1⅞ and 1½ in.

Threading Machine, Pipe, No. 1-2-4

Toledo Pipe Threading Machine Co., Toledo, Ohio. [Vol. 75,p.679.] 253.

All-steel construction, together with other design improvements, is responsible for high speed in threading, cutting-off and reaming of 1- to 4-in. pipe with the Toledo No. 1-2-4

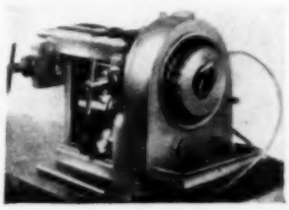


machine. Rake dies—a separate set for each size of pipe—assure smooth threads. A separate, quick-opening diehead of special design is used for each size of pipe. Dieheads can be interchanged by slipping off the supporting posts. Each chaser can be independently adjusted.

Threading Machine, Pipe, Portable

Axelson Mfg. Co., Ltd., P. O. Box 710, Vernon Sta., Los Angeles, Calif. [Vol.75,p.679.] 254.

This machine is capable of threading ⅛- to 2-in. pipe. The weight is 190 lb. Bolt threading dies may also be used. Automatic self-centering jaw chucks make it easier to center any size of pipe. An oil pump insures proper lubrication while threading.

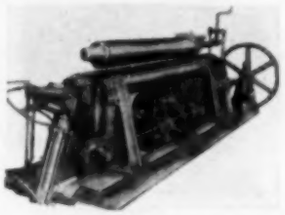


Other Machines

Bending Roll, Pyramid Type

Cleveland Punch & Shear Works Corp., Cleveland, Ohio. [Vol.75,p.393.] 81.

The Cleveland pyramid type bending roll was developed to roll small-diameter cylinders of heavy material. The photograph shows a shell rolled to 8 in. diameter. Features incor-

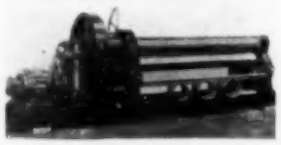


porated include an air-operated drop hinge to allow the cylinder to be removed from the roll, and an individual motor drive for operating the rolls and for raising and lowering the top roll.

Bending Roll, Plate, Unilateral

Schatz Mfg. Co., Poughkeepsie, N. Y. [Vol. 75,p.832] 302.

The usual flat surfaces at the plate ends are eliminated with this unilateral plate bending roll. The three rolls are mounted in steel housings, the front two rolls being arranged so that the center line of the top roll lies somewhat behind the center line of the lower roll, while the actual bending of the cylinders or cones is done by



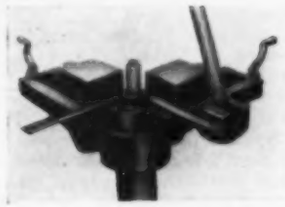
the adjustable rear bending roll. Scales permit duplication of roll settings.

An air cylinder causes the drop-end bearing to open, and at the same time the top roll is tilted upward to permit withdrawal of the finished cylinder or cone. These bending rolls are built to take plates from 41 in. to 20 ft. wide and for various thicknesses.

Bending Machine, Edgewise, Model S-31

Naudain Mfg. Co., 1001 Rectory Lane, Baltimore, Md. [Vol.75,p.828] 305.

For bending channels, angles, bulb angles, tubing, and other shapes edgewise, the Model S-31 machine has capacity of ¼x2½ in. cold on edge in copper or ¼x3 in. hot in steel. With a special head inserted, the capac-

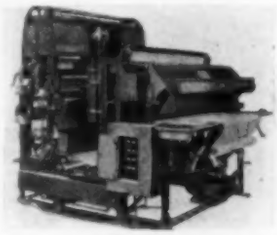


ity is 3½x1 in. for square bending. No wrenches are required for operating the machine.

Blueprinting Machine, Model 25

C. F. Pease Co., 813-821 No. Franklin St., Chicago, Ill. [Vol. 75,p.360.] 94.

The "Peerless" Model "25" continuous blueprinting machine is composed of three units, the blueprinting machine, the washing machine, and the pot-ashing, washing and drying



machine. The blueprinting machine can be operated independently by means of a simple clutch adjustment. All units are made in two sizes, 42 and 54 in. wide. Speed range is from 4 to 12 ft. per min., and power is furnished by a variable-speed, ¼-hp. motor.

Blueprinting Process, "Kyano"

C. F. Pease Co., 813-821 North Franklin St., Chicago, Ill. [Vol.75,p.721.] 250.

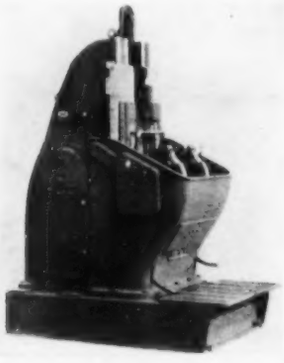
Deep, brilliant printing of blueprints or blue-line prints on either standard or fast printing papers without bleeding or run-

ning of blues into whites is accomplished with the "Kyano" process. Thus, the operator can make blueprints along with blue-line prints at any time and at the same printing speed. On blueprints which have been under-exposed the lines are reproduced in full width, even with fine pencil lines. The "Kyano" process attachment is shipped completely assembled so that installation on any Pease continuous machine can be made.

Broaching Machines, Surface, Duplex, Nos. 1 and 3

Foote-Burt Co., Cleveland, Ohio. [Vol.75,p.1009] 373.

For roughing or finishing one or more flat or irregular surfaces in one operation, the Nos. 1 and 3 surface broaching machines employ broaches made



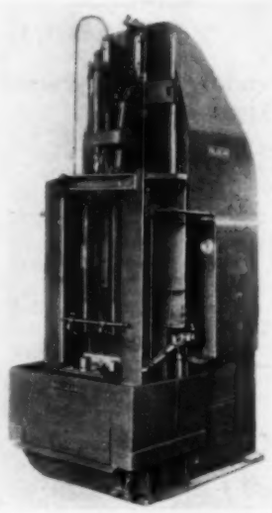
in sections and held in a holder on the slide. The design of the broach makes it possible to have rough, semi-finish and finish cuts all handled by one tool.

The No. 1 is capable of removing 3.3 cu.in. of mild steel per min., and the No. 3 will remove 8.6 cu.in. per min. Both machines have two broach slides, which counterbalance each other. Fixtures are located on the front of each slide, and move to and from the broaches automatically. In some cases, they are furnished with hand operated clamps, but in other cases they clamp the work automatically.

Broaching Machine, Vertical, "Cyclematic"

Oilgear Co., 1301-1417 W. Bruce St., Milwaukee, Wis. [Vol.75,p.1008] 362.

Centralizing work by hand is entirely eliminated on the vertical "Cyclematic" broaching machine. The operator lays the work flat on the table and treads on the starting pedal. From this point on, the entire broaching cycle is automatic. No broach handling is required, and the time of threading work over broach shanks is eliminated. The descending broaches accurately centralize the work.



Automatically the tables rises, drawing the work over the stationary broaches. All steps of the cycle are interlocked.

Burnishing Barrel "Ideal"

N. Ransohoff, Inc., Cincinnati, Ohio. [Vol.75,p.189.] 28.

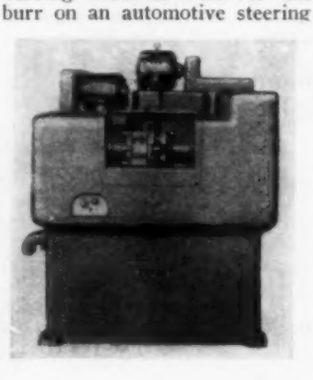
The burnishing operation is the same as with the standard type of barrel. When burnishing is completed the barrel is rotated in the opposite direction, the work is discharged auto-

matically through the screen, and the balls pass through the perforation in the screen and are retained in a cone. Running the barrel again in the burnishing direction causes the balls to return automatically to the burnishing compartment.

Burring Machine, Special, No. 3

City Machine & Tool Works, East Third at June Sts., Dayton, Ohio. [Vol.75,p.254.] 53.

This special "Peerless" No. 3 burring machine removes the burr on an automotive steering



gear sector. This operation is done at the rate of approximately 460 pieces per hour. A continuous but variable-speed rotation of the turret is employed. Each function of the machine is driven by a separate motor wherever possible.

Centrifugal Machines for Washing, Drying and Painting

Leon J. Barrett, Worcester, Mass. [Vol.75,p.220.] 45.

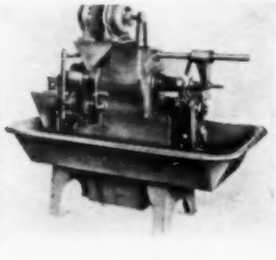
Various processing operations can be undertaken with these centrifugal machines by employing a proper bowl or container. The processes that can be performed include washing, drying, extracting, coating, saturating

and impregnating of small parts and articles. The centrifugal "Filwhirl Enameler," will coat a wide variety of articles of wood, fiber, or metal weighing from a fraction of an ounce to several pounds. The saving in time, evenness of the coating, and freedom from drippings and thick spots, together with bulk handling, permit economical finishing.

Cutting-Off Machine, Pipe and Rod

Rickert-Shafer Co., Erie, Pa. [Vol.75,p.252.] 58.

This cutting-off machine is suitable for pipe nipples, but is easily adapted to rods and tubing. The toolholders are mounted on oscillating arms controlled by adjustable cams. This construction gives any length of cut and feed desired. For cutting pipe nipples, a V-type forming tool makes the preliminary cut, after which the roller cutter on the opposite side completes the operation.



Cut-Off Machine, Type E, "Radiac"

A. P. de Sanno & Son, 1615 McKean St., Philadelphia, Pa. [Vol.75,p.862] 316.

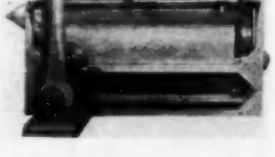
Automatic clamping and releasing, a quick-acting work stop, and the complete elimination of treadle operation are features of the Type "E"

Radiac cut-off machine. The machine is operated entirely with the right hand and the work is fed by the left hand. The material to be cut is held firmly in a cam-controlled clamp whose action is adjustable to accommodate work up to 2 in. Capacity, bar or flat stock is up to 2 in.

Drier, Air-Blast, Gas-Heated

N. Ransohoff, Inc., Cincinnati, Ohio. [Vol. 75,p.393.] 90.

This gas-heated, air-blast drier for handling parts from burnishing or bright dipping operations allows one man to take care of an entire day's production in three hours, releasing



the balance of his time for other work. The outfit consists of a revolving screen and a hood to prevent radiation. A gas-heated air blast heats the screen. The worm spreads the work out as it passes through, insuring rapid drying.

Drum Manufacturing Machines, Automatic

Niagara Machine & Tool Works, 637-697 Northland Ave., Buffalo, N. Y. [Vol.75,p.81.]

The four units illustrated automatically flange, bead and corrugate steel drum bodies. In order to attain the specially high and well-defined rolling bead desired by drum manufac-

turers, two units are used to accomplish this purpose.

All machines operate on both ends of the drum simultaneously. Production is five completed steel drums per minute. All motions except the rotation of the rolls are produced by hydraulic cylinders. The units can be adjusted and tooled for diameters ranging from 9½ to 24 in., and will accommodate lengths from 14 to 42 in.

Drum Manufacturing Machines

Niagara Machine & Tool Works, 637-697 Northland Ave., Buffalo, N. Y. [Vol.75,p.396.]

This is a compact set of machines designed for straight-line production of sheet-steel drum bodies having a compound side seam. At the left is a notching unit behind which is a live conveyor. A forming roll is placed in the center. A combination

press and seam closing attachment are placed at the right.

Four corners of the body blank are notched at one time by the notching unit. The blank then passes over the live conveyor to the forming roll. Here it is formed into a cylinder, is discharged, and rolls to a stop at the end of a short ramp. One stroke of the press produces channel-shaped formations near the adjacent edges, then one pass through the seam-closing attachment completes the seam. The seamed drum body is discharged by the closing attachment onto a horn ready for removal. Capacity of equipment, 5 drum bodies per min.

Filing Machine, Continuous, Model A-2

Grob Bros., 97th St. & W. National Ave., West Allis, Wis. [Vol.75,p.975] 349.

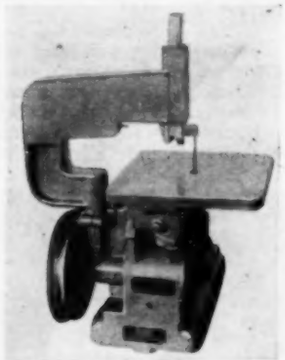
Speed and accuracy attained with the Type A-2 filing machine in filing and lapping of punches, dies and miscellaneous parts result from ball bearings throughout, a longer file back-support, higher die space, a single arm for the rubber roller guide, automatic stop for chain-tension. Positive drive of the chain is obtained through a series of equally spaced drive pins mounted in the lower

sheave. The tiltable work table is 17x21 in. Space between the table and the frame is 7¼ in.

Filing Machine, Die

Oliver Instrument Co., Adrian, Mich. [Vol.75,p.577.] 184.

The redesigned die-making machine can be furnished for motor-belt drive, direct motor drive, belt drive and for pedestal mounting. The table is of heavier construction, rigidly



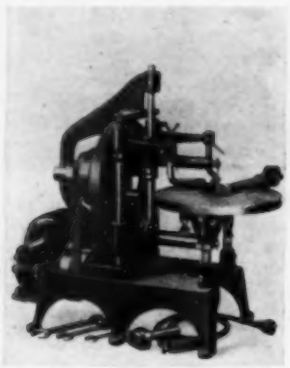
supported on two brackets and tiltable in four directions. The overarm is used for both filing and sawing. The overarm may be swung away from the file to remove the die for inspection. Hold-down fingers are attached directly to the overarm.

Filing and Sawing Machine, Die, Universal

Wittek Mfg. Co., 4305 West 24th Place, Chicago, Ill. [Vol. 75,p.576.] 186.

The machine has a stroke adjustable from 1¾ to 5¼ in. with three speed variations. The upper arm holder is adjustable vertically to hold files or saws up to 10 in. in length, and will also swing clear of the table.

The file and saw holders are universal and quickly detachable. The table is adjustable in any direction for sawing or filing clearances in all positions. It is also adjustable up and down. The screw feed is adjustable to any point on the circumference of the table.



Forging Machines, Friction-Drive

Acme Machinery Co., Cleveland, Ohio. [Vol.75,p.865] 320.

With a friction drive now embodied in the forging machines an increase in production from 15 to 20 per cent has been obtained from instantaneous starting, which also eliminates loss of heat from stock

being worked, and thus permits the metal to flow uniformly and makes for better forgings. The friction drive cushions the starting and stopping action.

Another improvement comprises cam movement for closing the dies, by which a uniform grip is secured throughout the long cycle. The fully suspended header and the movable die slides are out of the way of water and scale. Projected area of the pitman pin equals the projected area of the main crankpin.

Forming, Piercing and Embossing Machine, Multi-Slide

U. S. Tool Co., Inc., Ampere, N. J. [Vol.75,p.434.] 140.

A general-purpose, high-speed automatic machine known as the "Multi-Slide" has been brought out for low-cost production in the manufacture of light and medium-size metal stampings. Blanking, forming, piercing, embossing and cutting-off operations are performed accurately on coiled stock at production rates up to 300 pieces per minute. Beyond the feeding jaws, a cam-operated clamp holds the

stock in position in the die during the reverse movement of the jaws and while the tools are in operation. After the stock has been advanced from the cutting die, forming tools, operated by cams, shape the part.

Forming Machines, Cold-Roll, Series L

Kane & Roach, Inc., Syracuse, N. Y. [Vol.75,p.1012]

The basic design of these machines is such as to permit maximum adaptability in making individual changes as are needed for a specific job or class of work. In the machine illustrated "square" gearing is employed to cover the range of

depth of sections required. The outboard housings are adjustable for the width of the sections, and the upper shafts are quickly adjustable by handwheels and spur gearing. Shallow shapes can be formed on rolls of small diameter in an economical manner, and large-diameter rolls can be used to form deep sections without any change in the gearing.

Graduating Machine, Bevel, No. 48

Noble & Westbrook Mfg. Co., 20 Westbrook St., East Hartford, Conn. [Vol.75,p.470.]

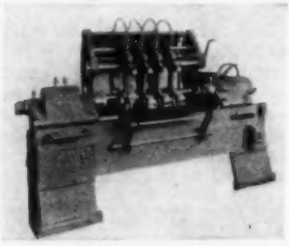
For graduating beveled micrometer collars the No. 48 graduating machine has the marking die carried on the spindle, driven by hand power

through spiral gears. The micrometer collar is held on a separate spindle placed at the proper angle to bring the beveled marking die and the beveled micrometer collar together.

Lapping Machine, Type 40

Norton Co., Worcester, Mass. [Vol.75,p.1010] 361.

The lapping arms are equipped with telescoping reels, each of which carries a roll of abrasive paper. Each time a lapping arm is removed from a pin or bearing, these reels are indexed automatically. By means of a



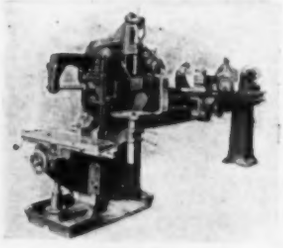
reciprocating mechanism in the headstock, the shaft is caused to move back and forth in the direction of its axis. This improves the finish and eliminates grinding wheel marks.

The machine will swing 16 in. over the table and will accommodate a maximum length of 48 in. Crankshaft pins and bearings up to 2½ in. in diameter by 4½ in. long can be lapped.

Machine Tool, Universal Model UM-2

H. A. Weaver, 8843 Livernois Ave., Detroit, Mich. [Vol. 75,p.502.] 153.

Four machine tools are combined in the Model UM-2 universal machine tool built by the Krause Co. in Germany and represented in the United States



and Canada by the above agent. The Model UM-2 embodies a lathe, a drilling machine, a shaper and a milling machine. The lathe and drilling machine are always ready for operation, and either the milling machine or shaper can be used at the same time.

Pickling Equipment

N. Ransohoff, Inc., Cincinnati, Ohio. [Vol.75,p.576.] 187.

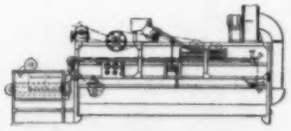
Work up to 24 in. long can be handled, and soft threaded work is processed without damage. The work is charged into the first unit of the assembly by a crane. The drum rotates at 6 r.p.m. to agitate the work gently in a flowing bath of sulphuric acid. The work is then

discharged into a screen section to drain. In the third section the work is subjected to a water spray and passes to a fourth section where it is drenched with a fluxing solution of zinc chloride or muriatic acid.

Plating Machine, Chromium, Automatic

Sturt Engineering Corp., 7001 North Clark St., Chicago, Ill. [Vol.75,p.614.] 199.

A fully automatic plating machine capable of delivering 90,000 to 120,000 chromium-plated screws or bolts per day has been developed. The essential parts of the machine are the

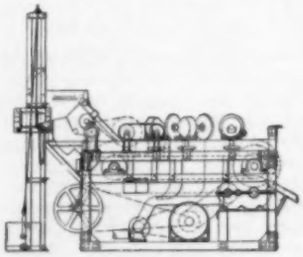


feed hopper, feeding mechanism, conveyor and screw holders. Adjustment of the feed hopper and feeding mechanism permits of a great variety of sizes being plated, a No. 6 screw being handled as easily as a 2x ¼-in. screw.

Buffing and Polishing Machine, Automatic, for Screws and Bolts

Sturt Engineering Corp., 7001 North Clark St., Chicago, Ill. [Vol.75,p.647.] 200.

The work is carried to the buffing wheels by means of a power conveyor, and hand buffing is simulated by presenting the work to the wheels at three different angles. The machine is designed to feed 200

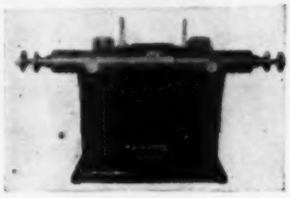


1¼x¼-in. screws per min. Adjustable slides in the feed hopper and simple adjustments in the feeding mechanism, working groove, operating cam and thrust slides set the machine for any desired size from a No. 6 to a 2½x⅜-in. screw. The machine is designed to feed 200, ¼ by 1¼ in. screws per min., and larger sizes in proportion.

Polishing and Buffing Lathe, Type CCO "Rite Speed"

Hammond Machinery Builders, Inc., Kalamazoo, Mich. [Vol.75,p.794.] 294

Two independent overhanging spindles are used in the Type CCO "Rite Speed" polishing and buffing lathe. Each



spindle has its own motor, starter, multi-V-belt, switch, and brake. Each spindle can be operated independently of the other. Consequently, the machine is recommended where wheel changes are frequent or two different speeds are required.

Polishing Machines, Centerless-Feed, No. 101

Production Machine Co., Greenfield, Mass. [Vol.75, p.1011] 350.

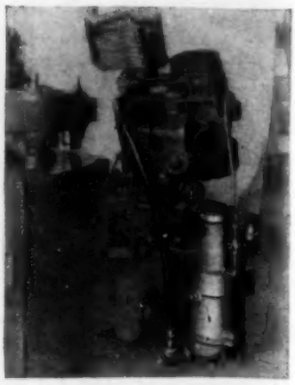
For production polishing and buffing on work up to 6 in. in diameter, this No. 101 centerless-feed machine has a belt feeding device for the feeding member so that skilled polishing

labor can be done away with. Taper roller bearings are used for all shafts, and forced-feed lubrication is employed. Provision is made for quick set-ups. Specifications: floor space for direct motor drive, 47x56 in.; wheel spindle, 1¾ in. in diameter; machine adjustable for wheels 10 to 16 in. in diameter, with 4 in. face and 1¾ in. hole.

Abrasive-Grain Feeder for Polishing and Buffing Machines

Hammond Machinery Builders, Inc., Kalamazoo, Mich. [Vol.75,p.471.] 137.

This device reduces cost in both material used and time of applying composition to polishing and buffing wheels. It is operated by means of compressed air. The composition paste is delivered through a distributing nozzle directly onto the polishing or buffing wheel.

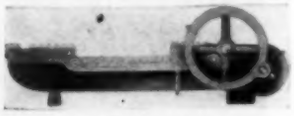


The centrifugal force of the wheel carries the composition to a collector pad, which presses against the polishing wheel.

Press, Assembling and Broaching

Nichols & Rainsford, Citizens Bldg., Cleveland, Ohio. [Vol. 75,p.39.] 12.

This machine can be adjusted over a wide range and positioned accurately to press to a definite distance. The bed can be furnished in lengths to give distances between the rams of 24 to 96 in., and the machine can be designed for operating



pressures from 25 to 100 tons.

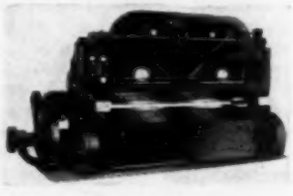
The stationary ram is provided with handwheel for adjustment. Stroke of the moving ram is fixed, being given by a hardened and ground uniform-motion cam on the main-shaft. The double-reduction gear drive is taken from a motor through a backshaft at the head of the bed to a large gear on the main-shaft.

Press Brake

Farrel-Birmingham Co., Inc., Ansonia, Conn. [Vol.75,p.902.]

In the Rafter design, the power is applied from below so that the ram is pulled into the work. Motion is transmitted to the ram by two special, C-shaped connecting rods actuated by an eccentric located within the base. The uprights are employed only to keep the ram in alignment. The A-shaped base requires no foundation other than a flat bed of concrete.

The brake is an open-throat machine, permitting the utiliza-

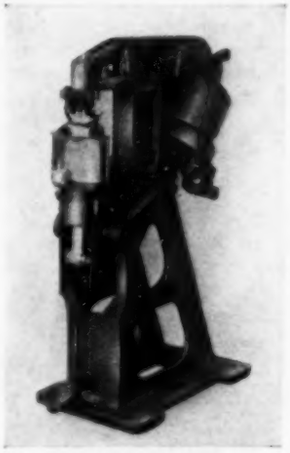


tion of the dies for the full length of the ram and base. For work that must be passed through the machine, ample space is provided in the rear. Rolled steel plates, fabricated by welding, are used for the brake. The quick-release die-holder is a feature. Sizes up to 300 tons capacity are carried in stock.

Press, Riveting and Assembling, Vertical

Hanna Engineering Works, Inc., 1765 Elston Ave., Wicker Park Station, Chicago, Ill. [Vol.75,p.647.] 235.

In addition to driving rivets, this machine functions as an assembly fixture. The parts can be placed into it progressively in a manner requiring no dex-

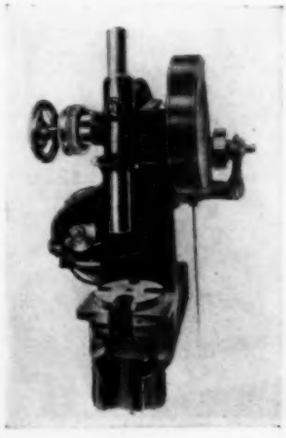


terity and are then clamped quickly by power. The fixture is opened by foot, and the operating valve is also foot actuated. Consequently, the operator's hands are free.

Press, Arbor, Motor-Driven, No. 50

Greenerd Arbor Press Co., 41 Crown St., Nashua, N. H. [Vo.75,p.1011] 365.

This No. 50 arbor press of 3-ton capacity was especially developed for rapid continuous assembling, broaching, stamping,



and die work, as well as for general utility operations. It is equipped with anti-friction bearings, semi-steel castings, and alloy heat-treated pinions. The ram stroke is adjustable from ½ to 11¼ in. Work to 12 in. in diameter can be taken.

Processing Conveyor Midget

Meaker Co., 1615 So. 55th Ave., Cicero Sta., Chicago, Ill. [Vol.75,p.1014] 374.

A processing conveyor of small size for use in plating, pickling, rinsing, washing, lacquer dipping, and drying operations has been developed. The conveyor is portable and

its field of use lies between the semi-automatic and the return-type full automatic machines. The conveyor travels in horizontal loop, with the rack carrying arms pivotally mounted along the heavy chain. At the locations where transfer is desired an eccentric cam forces the supporting leg outward, which in turn elevates the carrying arm and causes the rack of material to be raised out of the tank.

Riveter, Mechanical, Electrically Driven

Norin Engineering Co., 355 North Union Park Court, Chicago, Ill. [Vol.75,p.399.] 114.

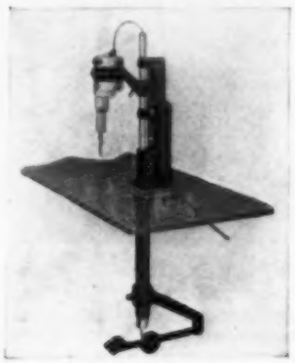
This mechanical riveter is driven by a 1½-hp. motor mounted in the head frame with the plunger mechanism. The

pressure exerted is 25 tons. Energy is delivered from a flywheel, the power being transmitted through planetary gears to a release clutch and an operating clutch. This machine is also suitable for embossing.

Screw Driver and Nut Setter, Electric, Foot-Operated

R. G. Haskins Co., 4636 W. Fulton St., Chicago, Ill. [Vol. 75,p.901.] 323.

As the unit is operated with the foot, both of the operator's hands are free to assemble the parts. The standard power unit includes a split-phase, induction-type, motor with a single gear reduction. By means of a

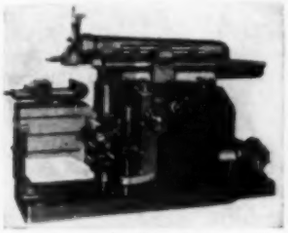


clutch which is independent of the torque device, the bit revolves only at the time the screw or nut is driven. The nut is counterbalanced. Stop collars provide adjustment of the stroke. The machine can also be mounted on a cast-iron pedestal base. An adjustable table is attached to the pedestal.

Shaper, Hydraulic

Rockford Machine Tool Co., Rockford, Ill. [Vol.75,p.829.]

Constant cutting speed and tool pressure throughout the stroke are features of this hydraulic shaper. The rapid reversals of the shaper ram are smooth and shockless. Maximum ratio of the return cutting speed has been set at 3.73 to 1.



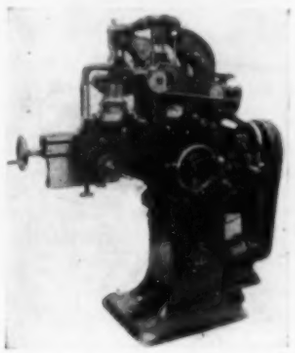
The number of feeds is unlimited up to a maximum of 0.160 in. Feed movement is practically instantaneous. A pair of dogs governs both the stroke length and its position relative to the work. These dogs can be adjusted quickly and safely by hand while the ram is in motion. Altering the stroke length does not change the cutting speed.

Specifications: Stroke, 25 in. maximum, 1 in. minimum; strokes per minute, 150; cutting speeds, 0-120 ft. per min.; table top, 16x24 in.; maximum distance, table to ram, 18 in. cutting force, 5,800 lb.

Shaper, Form and Punch, Vertical, Thiel 32

Marburg Bros., Inc., 90 West St., New York, N. Y. [Vol.75, p.680.] 268.

For the manufacture of irregular shaped punches or similar work, the Thiel 32 vertical punch and form shaper uses an ordinary cutting tool. The cut-

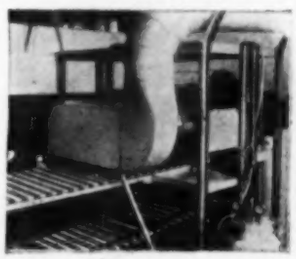


ting tool after completing its downward travel swings back and thus produces the supporting shoulder. The radius is predetermined, with a minimum of ⅛ in. Radii and spacings are easily and accurately shaped with the aid of a dividing head.

Spraying Machine, Paint, Automatic

Willard C. Beach Air Brush Co., 201-207 Second St., Harrison, N. J. [Vol.75,p.683.] 270.

This "Automatic Spracoater" automatically spray-finishes objects carried past it by a conveyor or material fed through rolls. It can be adapted for

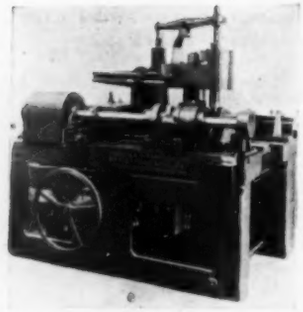


steel furniture, refrigerators, sheet metal work, electrical equipment, toys, stove and range parts. The spray gun passes back and forth over the work, shutting off automatically at the end of each stroke. This insures uniform finish free from runs and "holidays," and reduces waste of material.

Spring Winding Machine, Torsion, No. 2½

Sleeper & Hartley, Inc., Worcester, Mass. [Vol.75,p. 574.] 189.

This machine coils wire ranging from No. 14 to ¼ in. In the smaller wire sizes it will produce springs with up to 50 coils at 20 springs per min., while in the larger wire sizes,



25 coils may be wound at 10 springs per min. Regardless of wire size, projecting ends from 7 to 12 in. long may be left on either or both ends, and in some cases these ends may be formed automatically as they come from the machine. Coils up to 4 in. in outside diameter may be produced.

Swaging Machines, Redesigned

Langelier Mfg. Co., Providence, R. I. [Vol.75,p.362.] 108.

The machine spindle is now mounted on Timken bearings, superseding the former plain bearing mountings. Eleven sizes having capacities from $\frac{3}{16}$- to 9-in. work are available. The

first five machines are of $\frac{3}{16}$, $\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{8}$ and $1\frac{1}{4}$ in. maximum tube capacity and have standard die lengths of 1, 2, 3 and 4 in. Die lengths for the larger machines are furnished to suit.

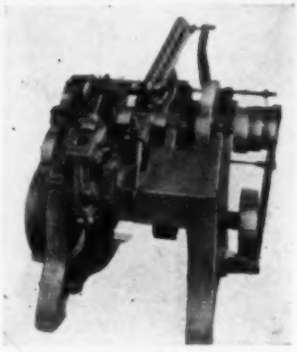
Lubricant is fed to the dies, hammerblocks, hammerblock rolls and headrolls from two sources, one from the center of the spindle outwardly, the other from the outside forced under pressure. As a further cooling medium for hot swaging, all machines, with the exception of the "A" type, now have water jackets in the head.

Thread Rolling and Trimming Machine

V & O Press Co., Union Turnpike, Hudson, N. Y. [Vol. 75,p.1013] 364.

Shells up to 6x6 in. can be handled on the No. $202\frac{1}{2}$ automatic thread rolling and trimming machine. The trimming attachment has capacity to trim 1/16 in. mild carbon steel. Beading, knurling, scoring, and flatside rolling can be done.

The two clutch shafts and the rocker arm, which is operated from an auxiliary shaft, are driven through the same train of gears. The rocker arm is actuated by an adjustable tog-



gle motion, insuring smooth threads of uniform depth, and permitting a variation in the number of revolutions during which the work is held under pressure. The spindles extend beyond the front of the bed to give free access to the chucks.

Tracer, Combination, for Keller Automatic Toolroom Machines

Pratt & Whitney Co., Keller Div., Hartford, Conn. [Vol.75, p.646.]. 245.

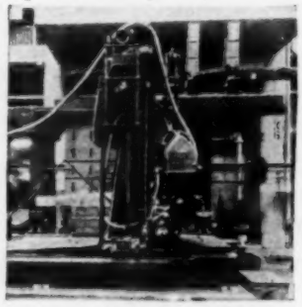
A combination tracer, which combines the operations of the two electrical tracers ordinarily used on Keller automatic tool-

room machines, is now available. This tracer makes it possible to follow all three dimensions of a model at the same time. The improved method gives a smooth finish.

Right- and Left-Hand Attachment for Large Automatic Toolroom Machine

Pratt & Whitney Co., Keller Div., Hartford, Conn. [Vol. 75,p.866] 301.

This right- and left-hand attachment is now available for work of all size, including large stamping dies. For example, with this attachment it is now possible to produce from a wooden pattern of a right-side panel both the right and left panel punches, whereas in the past it was necessary to have a pattern of each panel. The work piece remains stationary, but the movement of the model in connection with the movement of the cutter has

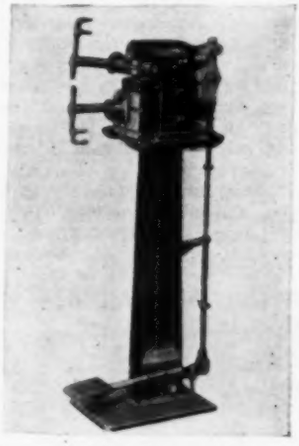


the same effect as if the model travels in the opposite direction of the work piece, so producing a "left" from a "right," or vice versa.

Welding Machines, Spot

Eisler Electric Corp., 744-772 South 13th St., Newark, N. J. [Vol.75,p.681.] 260.

Spot welders from $\frac{1}{2}$ to 35 kva. are manufactured. This line makes possible the handling of combined thicknesses of steel

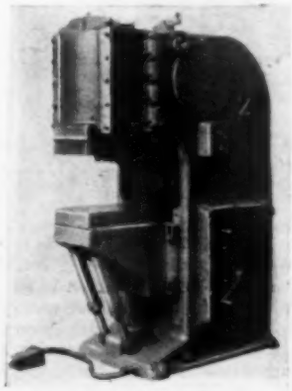


from .00052 to $\frac{3}{8}$ in. Both foot and motor-driven types are available.

Welding Machine, Spot and Multiple-Projection

Taylor-Winfield Corp., Warren, Ohio. [Vol.75,p.864] 310.

A heavy press welder, known as the EX-Series, has been developed for projection welding where it is desired to make a large number of projection welds at one time. The ma-



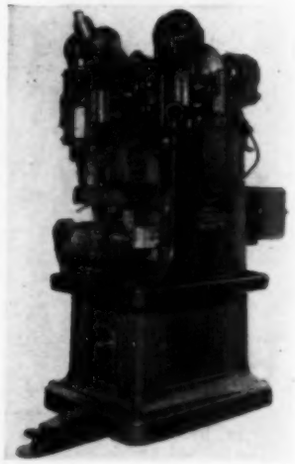
chine will be furnished with transformer capacities of 200 250, 300, 350, 400 or 450 kva., and with throat depths of 18, 24, 30 or 36 in.

A nine-step, self-contained heat regulator gives adjustments for various sizes of stock. The knee has a vertical adjustment of 10 in. Any desired speed from 7 to 54 strokes per min. may be had at pressures up to 8,000 lb. Length of stroke from 1 to $2\frac{1}{4}$ in.

Welding Machines, Projection, Type C.D.

American Electric Fusion Corporation, 2610 Diversey Ave., Chicago, Ill. [Vol.75,p. 391.] 106.

The machine has a capacity of 75 kva. and will spot weld two pieces of $\frac{1}{4}$-in. material. Pressure at the die blocks peaks at 5,000 lb. In the base is the heat regulator, with eight steps provided through a dial switch;

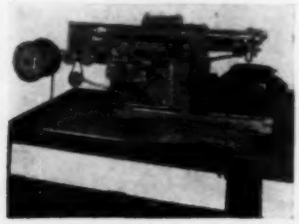


in the column, the transformer and auto coil. The unit head contains the motor and toggle mechanism and is self-lubricated. Two throat depths are available: $12\frac{1}{2}$ and $24\frac{1}{2}$ in.

Wire Stripping Machine

Artos Engineering Co., 327 East Brown St., Milwaukee, Wis. [Vol.75,p.37.] 3.

This Type CS No. 6 machine will automatically measure and cut up to No. 12 B & S wire to any desired length up to 15 in., but attachments are supplied for maximum cutting lengths of 30, 45, 60 and 90 in. In the same operation, the machine strips the insulation, being adjustable from a minimum of $\frac{1}{8}$ in. to a maximum of $1\frac{1}{2}$ in.



Portable Tools

Blower, Portable, Type 403

Speedway Mfg. Co., 1834 South 52nd Ave., Cicero, Ill. [Vol.75,p.539.] 180.

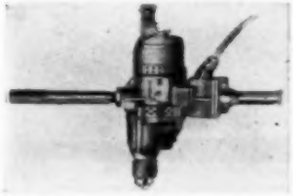
A blower delivering a blast of clean and dry air at high velocity for cleaning and blowing purposes is being manufac-

tured. All-steel construction gives high strength with low weight. A soft rubber nozzle eliminates shorting when cleaning switches or wiring. The unit is balanced and has a pistol grip and thumb-operated toggle switch.

Drill and Hone, "Thor"

Independent Pneumatic Tool Co., 600 West Jackson Blvd., Chicago, Ill. [Vol.75,p.574.] 185.

The No. UFH machine has ball bearings throughout. Drilling capacity is $\frac{3}{4}$ in., reaming capacity $\frac{7}{8}$ in., length over-all, 18 in. The spindle offset is $1\frac{1}{16}$ in., and the weight, $25\frac{1}{2}$ lb.



Flexible-Shaft Machines, Model M Series

McNeil Brothers Co., Cincinnati, Ohio. [Vol.75,p.611.] 213.

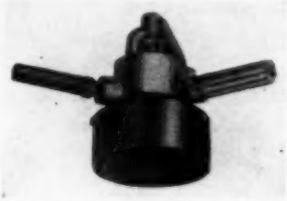
Two universally applicable flexible-shaft machines have been announced. A high-speed attachment can be installed to

give six speeds from 875 to 10,500 r.p.m. Without the high-speed attachment the machines provide three speeds. The hand piece may be fitted with Timken roller bearings or with ball bearings. Drive from the motor to the shaft is by means of a cone pulley and V-belt.

Grinder, Surface, "Multi-Vane"

Ingersoll-Rand Co., 11 Broadway, New York, N. Y. [Vol. 75,p.82.] 7.

The Size 4F is suitable for grinding, sanding, polishing, and wire-brushing operations. It is built with two handles, one of



which may be removed to facilitate working in close quarters. Standard free speed is 4,600 r.p.m.; weight is $10\frac{3}{4}$ lb.

Hammers, Chipping, Ring Valve

Chicago Pneumatic Tool Co., 6 East 44th St., N. Y. C. [Vol. 75,p.758.] 282.

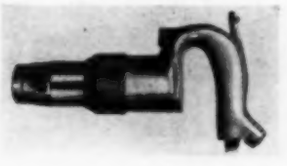
The valve is a simple band ring placed over the end of the cylinder and has a movement of $\frac{1}{64}$ to $\frac{3}{32}$ in., depending upon

the size of the hammer. This construction permits elimination of the valve case and dowel pins. A locking device automatically tightens the handle.

Hammers, Chipping and Riveting, Pneumatic

Buckeye Portable Tool Co., Dayton, Ohio. [Vol.75,p.614.]

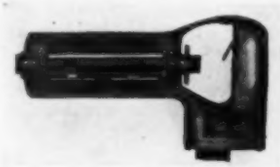
No valves or flapper plates are used in this pneumatic high-speed chipping and light riveting hammer. The one-diameter piston is the only moving part and it is self-controlled. Vibration has been eliminated.



Hammer, Electric

Syntron Co., Pittsburgh, Pa. [Vol.75,p.256.] 59.

This reciprocating-type electric hammer is available for calking, riveting and chiseling and also for stone drilling in sizes for drilling $\frac{3}{8}$- to 2-in.

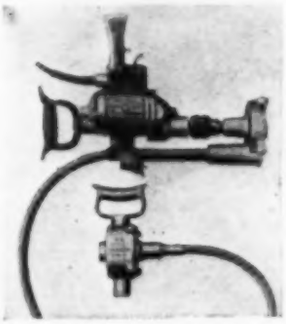


holes in concrete. The piston is the only moving part and is reciprocated by two powerful electric magnets wound around the barrel of the hammer. The tool produces 3,600 blows per min.

Hammer, Electric

United States Electrical Tool Co., Dept. 44, 2489 West Sixth St., Cincinnati, Ohio. [Vol.75, p.862] 319.

This electric hammer weighing only nine pounds is operated through a special flexible



shaft attachment connected to any light-type $\frac{1}{2}$-in. electric drill. Up to 4,000 blows per min. are struck.

Polisher and Sander

United States Electrical Tool Co., Dept. 44, 2490 West Sixth St., Cincinnati, Ohio. [Vol.75, p.399.] 109.

Combining a drill, sander, buffer and polisher, this "U.S. C-200 Combination Polisher," with a keyless chuck, operates drills, wire brushes, abrasive wheels, rasps and other accessories. The 5-in. flexible pad accommodates sanding disks, lamb's wool polishing bonnets and felt rubbing pads.

Sander, Belt, "Hercules"

Buckeye Portable Tool Co., Dayton, Ohio. [Vol.75,p.503.] 163.

For smoothing down welds and large steel dies, and for finishing sheet metal, this portable belt sander will work on either flat, convex or concave surfaces, a special attachment

for concave surfaces being an added feature. It is powered by two rotary air motors. Belt size is $2\frac{3}{4}$x57 in., distance between pulley centers, 21 in.; motor speed, 4,300 r.p.m., and weight, 46 lb.

Sander, Belt, Continuous Portable "Hicycle"

Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y. [Vol. 75,p.1013] 376.

For grinding and polishing straight and curved surfaces in wood and metal, the "Hicycle" portable belt sander employs a flexible, endless abrasive belt

driven by two Hicycle motors, one at each end. Belt tension is maintained by means of a telescopic air cylinder. Handles on the ends and a suspension bail pivoted at the center of gravity provide convenient means for operating the sander in any position. A suspension balancer can be had for holding the tool at any height.

Saw, Portable

United States Electrical Tool Co., Dept. 44, 2490 West 6th St., Cincinnati, Ohio. [Vol. 75, p.221.] 42.

This saw will do several types of sawing, including cross, rip, plane, rafter, bevel cutting and pocket cutting on stone and slate. Two adjustments set the

saw for any depth and for any angle through 60 deg. A patented beveling device does away with the need for a try-square. A clear-vision blower keeps sawdust away from the markings. The saw is made for depths of $1\frac{7}{8}$, $2\frac{3}{8}$, $3\frac{1}{16}$, $3\frac{7}{16}$, and $4\frac{3}{8}$ in.

Spray Gun, Model 2, "Thor"

Binks Mfg. Co., 3114-40 Carroll Ave., Chicago, Ill. [Vol. 75,p.429.] 129.

A variable spray is produced by the screw control on the back of the gun. By means of a stationary tapered seat, the air nozzle is always aligned with the fluid tip, and no regulation is required at this point. The

body is drop-forged steel, while the handle is a zinc-base die-casting. Both fluid nozzle and needle valve are of stainless steel, while the air nozzle is drop-forged bronze. The gun can be used with a siphon feed cup, gravity feed container, or a pressure-feed container.

Tapper, Pneumatic, for Stud Holes

Independent Pneumatic Tool Co., 600 West Jackson Blvd., Chicago, Ill. [Vol.75,p.471.]

This No. 254 R rotary pneumatic tool is especially adapted for tapping and re-tapping stud holes on locomotive boilers. It is capable of tapping up to 1 in.

and re-tapping holes up to 1¼ in. Specifications are: speed, 100 r.p.m.; weight, 19 lb.; length over-all, 14¼ in.

Wrench, Pneumatic, Rotary, No. 288, "Thor"

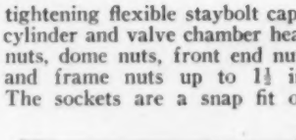
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill. [Vol.75,p.936]

This wrench will remove 1¼-in. cylinder head bolts and all flexible staybolt caps. An auxiliary handle is provided for use in close quarters. The speed is 160 r.p.m., the length over-all, 41½ in.; the spindle offset, 2¼ in., the length of spindle, 9⅞ in., and the weight, 48 lb.

Wrench, Pneumatic, Rotary

Chicago Pneumatic Tool Co., 6 East 44th St., New York, N. Y. [Vol.75,p.187.] 25.

The No. 335-130 rotary pneumatic wrench is suitable for tightening flexible staybolt caps, cylinder and valve chamber head nuts, dome nuts, front end nuts and frame nuts up to 1½ in. The sockets are a snap fit on



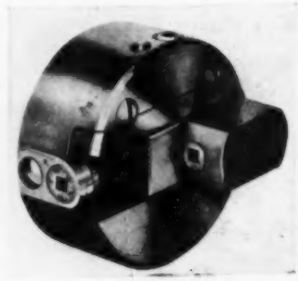
the spindle, assuring quick interchange. The light speed is 130 r.p.m., the over-all length, 7$\frac{7}{32}$ in., and the weight, 48 lb.

Small Tools

Boring Head, Micrometer, No. 30, Flynn

J. M. Waterson, 427 Woodward Ave., Detroit, Mich. [Vol.75,p.936] 346.

Dovetail design is employed in the No. 30 Flynn micrometer boring head, which is particularly adapted for use where a



large offset is required, the capacity of this tool being 2½ in. The dial is graduated in thousandths, fifty thousandths to a turn. Bar capacity is ¼ to ¾ in., body diameter 4½ in., body length, 1⅞ in., and the weight, 8 lb.

Broach, Involute-Tooth, for Internal Gears

Ex-Cell-O Aircraft & Tool Corp., 1200 Oakman Blvd., Detroit, Mich. [Vol.75,p.940]

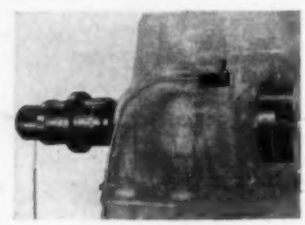
The broach starts from a drilled hole. The section at the pull end is designed for sizing the hole and the remainder for broaching the form on each tooth. Broaches in a range of diameters with a corresponding range in number of teeth can be furnished. Limits on these broaches are held to 0.0003 in.

on the splines, outside diameter to 0.0001 in., and the accumulated error in the spacing of the teeth not to exceed 0.0002 in.

Chuck, Electrically Operated, "Cushmatic"

Cushman Chuck Co., Hartford, Conn. [Vol.75,p.253.] 54.

Power is used only when the chuck jaws are being closed or opened. The equipment consists of two distinct units, a lever-operated chuck having two or more jaws and a motor with gear reduction. These units are

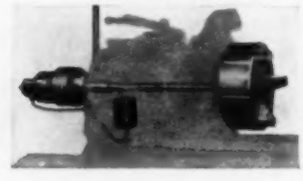


connected by a drawbar of suitable length, and a control box is arranged to regulate the pull of the drawbar. In the control box are housed reversing switches, and also when required a rheostat control to permit flexibility in the chucking pressure. All sizes of Cushmatic chucks have been designed to give a combined jaw movement of 1 in. Chucking pressure developed is a maximum of 10 tons.

Chuck, Power-Operated, Electric

Union Mfg. Co., New Britain, Conn. [Vol.75,p.578.] 195.

An electric power-operated chuck of the drawbar wedge type for outside and inside chucking has been developed. A push button is depressed until the jaws of the chuck grip the work, the approximate chucking



time being 1½ seconds. Jaw pressure can be increased or decreased to suit the work. Combined bottom jaw movement is ¾ in. Hardened adjustable step-along-top jaws are provided. Drawbar pulls range from 20,000 to 40,000 lb.

Cutter Adapters, End Mills and Arbors

Brown & Sharpe Mfg. Co., Providence, R. I. [Vol.75,p. 222.] 30.

The adapters are furnished in two different styles for use with milling machines having standardized spindle ends, and also in one style for use on milling machines having a taper or

threaded-nose spindle. Adapters are furnished with a milling machine standard taper hole into which the shank of the end mill or arbor fits and are held securely to their seats by cams furnishing a positive drive.

Cutter Adapters

Brown & Sharpe Mfg. Co., Providence, R. I. [Vol.75,p. 504.] 157.

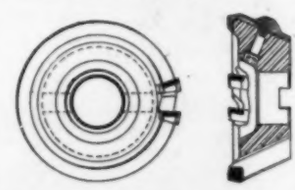
Cutter adapters are available for use with milling machines having a standardized spindle

end with No. 40 taper, to accommodate end mills and collets having No. 3 Morse and Nos. 7 and 9 B. & S. taper shanks

Cutters, Milling, Inserted-Blade, Type RC and R

Ex-Cell-O Aircraft & Tool Corp., Continental Tool Division, 1200 Oakman Blvd., Detroit, Mich. [Vol.75,p.363.] 103.

These cutters are known as Type RC roughing and finishing milling cutters when used with



Carboloy-tipped blades and Type R when used with high-speed steel or Stellite blades.

The cutter body is hardened and ground. Wear on the slots

is taken up by the taper on the blades. Blades are of the wedge type, anchored securely by means of a holding clamp, each clamp anchoring two blades in position. An individual horizontal adjustment can be made on each blade to compensate for wear or breakage.

Cutter Blades and Tools, Tungsten-Carbide

O. K. Tool Co., Inc., Shelton, Conn. [Vol.75,p.503.] 166.

Cutter blades tipped with tungsten-carbide and tools embodying these blades are being manufactured. The cutter blades are made in many varieties and shapes and are applicable to milling cutters, boring and facing tools, and single toolholders. They are offered to be interchangeable with any of the standard cutters now used.

Cutters, Inserted-Tooth,

Union Twist Drill Co., Athol, Mass. [Vol.75,p.502.] 151.

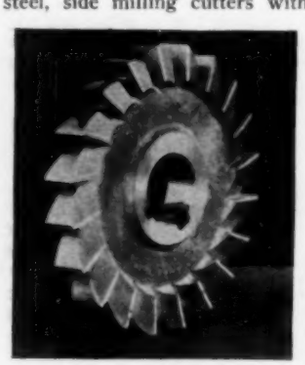
These cutters have high-speed steel blades serrated at the back and set with taper wedges in the front. Radial adjustment is $\frac{1}{16}$ in. For face-milling cutters from 4 to 7 in. in diameter the

serrated - blade, shell - end - mill type is recommended. Dimensions of mill and arbor to fit are the same as for the National Standard solid shell end mills. For cutters 8 in. and larger, the company furnishes face mills to bolt directly to the standard spindle nose.

Cutters, Side-Milling, "National-Cleveland"

The National Tool Co., Cleveland, Ohio. [Vol.75,p.221.] 36.

These die-forged, high-speed-steel, side milling cutters with



unfinished web recesses are available in all standard sizes from 3 in. outside diameter up. They are die-forged from billets.

Cutters, Milling, T-C, Inserted-Blade

Kearney & Trecker Corp., Milwaukee, Wis. [Vol.75,p. 974] 357.

Formerly made only in a range of sizes from 5 to 14 in., these cutters are now available in 3- and 4-in. sizes. Known as the fullback blade type, each blade is provided with a solid positive contact along the entire back face. The blades are set

practically flush with the face. Each blade is made with a tapered face and is held in place by a wedge having a corresponding taper. Uniform advance of each blade is obtained by locating pins. By having a series of five holes in each body slot and four cross-slots in each blade, adjustments can be made in increments of 1/16 inch.

End Mills, Spiral, Straight-Shank, Two-Lipped

Brown & Sharpe Mfg. Co., Providence, R. I. [Vol.75,p. 719.] 279.

These two-lipped end mills are of the straight-shank type, and are furnished in high-speed steel, both right and left hand,

and are made in a complete range of sizes. The diameters range from $\frac{1}{4}$ to $\frac{3}{4}$ in., and the length of cut from $\frac{3}{8}$ to $1\frac{1}{4}$ in.

Stellite J-Metal

Haynes Stellite Co., Kokomo, Ind. [Vol.75,p.500.] 147.

This special grade of Stellite was developed for cutting cast iron, semi-steel, and steel. Known as J-Metal, it will cut these materials with the feed and depth of cut usually employed when turning cast iron and semi-steel with Grade 3 Stellite cutters. It will operate at a maximum speed 50 per cent greater. At the same speed, feed, and depth of cut, J-Metal will show an increase in cutting life of at least 100 per cent over Grade 3 and a ratio of 4 to 1 over the number of pieces formerly obtained per grind.

Tantalum Carbide Tool Set, "Toolpak"

Ramet Corp. of America, North Chicago, Ill. [Vol.75,p. 506.] 160.

Five small Ramet (tantalum-carbide) tipped tools, a toolholder and a special grinding wheel are packed in a wooden

case, comprising the Ramet "Toolpak." Two right-hand, one left-hand, one round-nosed and one grooving tool are contained in the set, adapted to the varied jobs of ordinary shops.

Tools, Tantalum-Carbide, with Molybdenum Inserts

Ramet Corp. of America, North Chicago, Ill., [Vol.75, p.758.] 285.

An insert of molybdenum is brazed between the steel shank and the "Ramet" tantalum-carbide tip. Molybdenum has almost the same coefficient of expansion as "Ramet," and prevents strains being set up or cracks developing in the cutting tip as the tool cools after the brazing operation. Such strains as may develop are absorbed by the molybdenum because of its ductility.

Cemented-Carbide for Cutting Steel

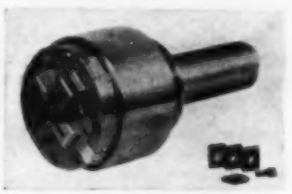
Thomas Prosser & Son, 15 Gold St., New York, N. Y. [Vol.75,p.756.] 288.

A non-cratering, cemented-carbide cutting metal developed especially for machining steel has been placed on the market. The composition permits increases in cutting speed when machining steel as great as those achieved with cemented tungsten carbide on cast iron and non-ferrous metals. This carbide product supplements tungsten carbide but does not supplant it. Chips slide off the surface of the tool with ease and are cut clean with no tearing action, resulting in less friction, so that the work remains cooler, and a much better finish is produced.

Dieheads, Self-Opening, with Inserted Chasers, "H & G"

Eastern Machine Screw Corp., Truman & Barclay Sts., New Haven, Conn. [Vol.75,p.503.]

Resharpening or regrinding of chasers is not required on the "H&G" self-opening dieheads. Instead of the usual large chasers of high-speed steel, carriers are substituted that take small high-speed inserts. These



inserts are held in place by a single screw that has a draw-in feature. This locks the insert back in the carrier to insure trackage and even distribution of the cut. These inserts are small and inexpensive and may be quickly replaced. Carriers for any diehead size are made to take inserts for a definite diameter range and are also used for both coarse- and fine-pitch series.

Drill Bushings, Standard

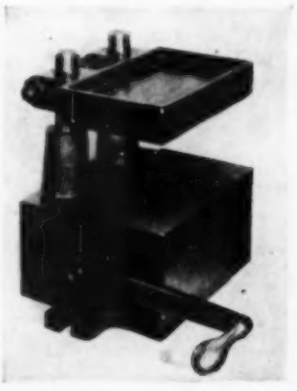
Universal Engineering Co., Frankenmuth, Mich. [Vol.75,p. 393.] 98.

This series of standard drill bushings is made to A.S.A. specifications, sponsored by the National Machine Tool Builders Association, the S.A.E., and the A.S.M.E. Economy of manufacture of the seven body diameters and three lengths permits making these bushings from Nitralloy at approximately tool steel prices. Each bushing has a screw lock on the head and a universal ball lock on the body.

Drilling Fixture

A. H. Pearson, 7 E. Grand Ave., Detroit, Mich. [Vol.75,p. 976] 360.

In the "Sure Clamp" drilling fixture, left-hand operation allows the operator's right hand

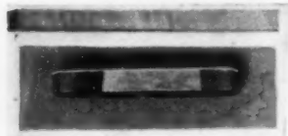


to be free for loading and starting feed. Right-hand operation is optional. These jigs combine positive locking with the additional feature of ¾ in. follow-up to care for variations in thickness of castings or forgings. Clamping pressures up to 1,000 lb. can be secured. Each size has 2 in. of adjustment.

Files, Surfacing

Production Engineering Co., North 1317 Maple St., Spokane, Wash. [Vol.75,p.435.] 125.

For filing flat, true surfaces in manufacturing and repair work, this file can be moved across the work like a plane or



held in a vise with the flat side upward so that the work may be drawn across it. Three sizes are 2x12, 3x12, and 4x12 in. A "Super Service" file or "safe maker's" file with parallel edges is made in a 12-in. length only.

Fixture Lock, Improved

Siewek Tool Co., 10232 Woodward Ave., Detroit, Mich. [Vol.75,p.645.] 243.

This fixture lock is improved so that no housing is required in order to adapt it for use. The housing can be cast on the fixture, making it possible to

bore the housing for the lock and shaft at the same time. The lock can then be applied. This method of applying the lock insures that it will be in alignment with the shaft, and eliminates necessity for doweling.

Grinding Disks, "Steelbac" Titan, Improved

Charles H. Besly & Co., 118-124 No. Clinton St., Chicago, Ill.

With the improved "Titan Steelbac" abrasive disks, the

abrasive is worn down to the steel backing plate and the plate is thrown away. The Steelbac consists of a comparatively thin steel plate on which the abrasive, bonded with Bakelite, is built. This grinding member is bolted to the steel disk wheel of the grinder.

Grinding Wheels for High Finishes

Carborundum Co., Niagara Falls, N. Y. [Vol.75,p.326.] 76.

These solid grinding wheels are capable of producing the high finishes ordinarily obtained by burnishing or by lapping with compound or any loose-

grained abrasive. Aloxite Brand aluminum oxide and Carborundum Brand silicon-carbide are used. The grinding wheels are not intended for production grinding in the sense of removing large amounts of metal. They can be used for finishing piston-pins, bearings and rolls. The cut shows comparative light reflectivity of pieces finished with these wheels (outer specimens) and those finished by other methods.

Mounted Wheels and Points, No. P-824 Production Set

Carborundum Co., Niagara Falls, N. Y. [Vol.75,p.361.] 89.

A production set of mounted wheels and points is available, incorporating the necessary practical shapes, sizes and in the right grits and grades in both mounted wheels and points

for the various types of portable grinders. The wheels and points are made of Aloxite Brand aluminum oxide. Spindles are copper-coated to assure a more secure mounting and give a rust-proof spindle. Included in the set are two rubber-bonded polishing wheels. In each set is also a Carborundum Brand dressing stick.

Hacksaw Blade, Heavy-Duty, Molybdenum

Victor Saw Works, Inc., Middletown, N. Y. [Vol.75,p. 830.] 299.

Hacksaw blades made of molybdenum steel have been

placed on the market. They are intended for heavy-duty operation, both hand and power. Molybdenum hardens steel, forms hard carbides and raises wear resistance. These blades are said to be lower in cost, uniform in cutting characteristics and capable of taking heavier cuts.

Hone Drivehead, Automatic

Hutto Engineering Co., Inc., 515 Lycastle Ave., Detroit, Mich. [Vol.75,p.863] 313.

This automatic drivehead to be used in conjunction with the standard production grinder (hone) is offered for providing faster stock removal, greater

accuracy, maximum stone life, and higher quality finish. The features include full-floating mechanism to compensate for uneven stone wear; rigid-type expansion medium, automatic stop control, and automatic contraction and expansion of the grinder as it is withdrawn from and inserted into the bore.

Hone, Automatic, Three-Finger, Model 1 A-O-F

Micromatic Hone Corp., Detroit, Mich. [Vol.75,p.1010]

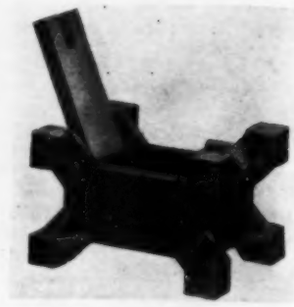
Among the improvements in this tool is that the drive ball is on drive shaft to increase strength. The cage spring assembly has the pressure regulated to suit customer's require-

ments. A recoil spring prevents lost motion between the fingers and the collar. The cone has an angle and travel equal to 0.484 expansion of the hone, or approximately $\frac{7}{16}$ in. total stone wear, in addition to collapsing movement.

Jigs, Box and Leaf

Siewek Tool Co., 10232 Woodward Ave., Detroit, Mich. [Vol.75,p.430.] 121.

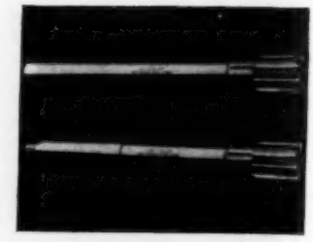
The leaf jig is of the handle type, with a cam for locking the lid, and drilling can be done from all four sides. The body is of aluminum with steel rest buttons on the feet. The box jig is a conventional type with a jig lock screw for clamping the lid, and drilling can be done from six sides. The box jig body is of semi-steel.



Reamer, Inserted-Blade, "SolEx"

McCrosky Tool Corp., Meadville, Pa. [Vol.75,p.363.] 100.

High-speed steel blades are held in slots in an alloy steel body by peening the body metal around the blades. A ground shoulder on the blade, just below the body diameter, allows the peened metal an extra hold.



The bottom of the blade is beveled crosswise, and the bottom of the slot in the body is milled with a corresponding cross angle to give increased strength to the body cross-section and to permit insertion of the maximum number of blades. Adjustment ranges from 0.052 to 0.131 in. according to size.

Standard machine reamers are furnished by thirty-seconds from ¾ in. to 1¼ in. and by sixteenths to 2 in.

Reamer and Tap Holder, Floating, Short-Nose

Scully-Jones & Co., 1901 S. Rockwell St., Chicago, Ill. [Vol.75,p.1007] 353.

Like the standard Scully-Jones holders this short-nose holder can be used with automatic screw machines and turret lathes, but it is particularly designed for multiple-head reaming and tapping machines

where the space is limited axially. Compared with the standard holder the collet is withdrawn within the tool body, and the overhang is reduced as well as the over-all length. The shoulder of the collet floats between two sets of ball thrust

carriers, the smaller of the two carrying the weight of the tools when the holder is mounted in a vertical position; the larger, the work reaction.

Reamer, Taper-Pin, "Helex"

National Twist Drill & Tool Co., Detroit, Mich. [Vol.75,p. 614.] 206.

In "Helex" taper pin reamers the steep spiral angle promotes smooth cutting and eliminates chatter. Sturdy backing of the cutting edges prevents chipping. For these reasons the reamer can be run at or near drilling speeds. Cutting edges are undercut. Reamers are furnished in carbon or high-speed steel in all of the regular sizes from Nos. 6/0 to 14.

Saw, Circular, Inserted-Tooth, 108-In.

E. C. Atkins & Co., Indianapolis, Ind. [Vol.75,p.544.] 70.

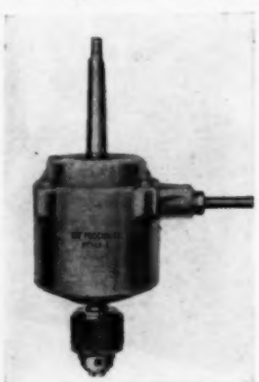
This saw is made of hardened and tempered "Silver Steel" plate. The 144 new style, Morris-type teeth are

held in the blade by milled grooves and rivets, with the sockets milled to insure even fitting and cutting. The saw travels at a speed of 470 r.p.m. Its diameter is 108 in. and thickness ¼ in.

Tapping Attachment, High-Speed, ¼-In.

Procunier Safety Chuck Co., 18 S. Clinton St., Chicago, Ill. [Vol.75,p.974] 355.

Speeds to 3,000 r.p.m. and reverse at 2 to 1 are features of this tapping attachment that

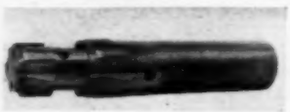


has a cork clutch, so that the tap slips instantly should it strike bottom or stick. Ball bearings and a three-point, balanced, hardened gear to reverse the mechanism are employed. The attachment is rated at $\frac{5}{16}$ in. in steel or ½ in. in brass.

Tap, Solid-Adjustable

Geometric Tool Co., New Haven, Conn. [Vol.75,p.40.] 15

This combination solid-adjustable tap is equipped with ground thread chasers for tapping $2\frac{1}{16}$ in. and $2\frac{1}{32}$ in., 14 threads per



in. All chasers conform to the U. S. thread form. The two taps are independent of each other and have individual and separate size adjustment control.

Toolholder, Adjustable-Length, Quick-Change

Wilder Tool Co., Greenfield, Mass. [Vol.75,p.223.] 21.

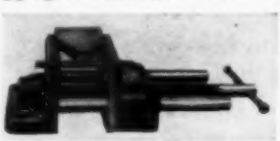
This adjustable-length, quick-change toolholder is designed for multiple-spindle operation of counterboring, core drilling, countersinking, hollow milling and combination multi-diameter, one-operation tools. The holder

is made of alloy steel, and tools can be guided from the outside diameter through guide bushings or from the end of hardened and ground removable pilots. The minimum length of adjustment is $\frac{3}{4}$ in., and the maximum length, $1\frac{3}{4}$ in., made direct by thousandths.

Vise, Drill-Press, Four-Point

Eagle Engineering Co., Springfield, Ohio. [Vol.75,p.82.] 17.

This four-point vise grips and supports symmetrical or irregular work, and will prevent sagging or twisting. The milled



jaw ledges and the cross rods are on the same plane, thus providing a uniform bearing support for the piece. Two V-slots are provided. The jaws are independently movable, and either jaw can be clamped to the table. The above concern acquired patent rights on the vise from Demco, Inc., Baltimore, Md.

Wrench, Pipe, "Red Head"

Steel City Electric Co., Pittsburgh, Pa. [Vol.75,p.536.] 110.

A one-piece, constant-adjustment, drop-forged pipe wrench, under the name of "Red Head," is being introduced. The tool has a toothed gooseneck upper head, which will fit pipe from ½ to 1 in. without adjustment.

Wrench Chest, Industrial, No. 48WD

Blackhawk Mfg. Co., Milwaukee, Wis. [Vol.75,p.792.]

This No. 48WD set is a practical combination of handles and sockets. The socket wrenches are equipped with the "Lock-On" drive, which prevents them from slipping off accidentally. Sockets range from $\frac{7}{16}$ to $1\frac{1}{4}$ in. double hexagon, in the standard series with ½-in. sq. drive; $1\frac{1}{4}$ to $2\frac{3}{8}$ in. double hexagon in the

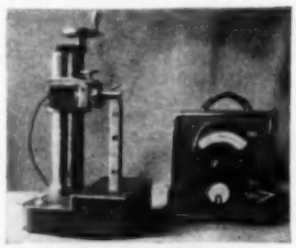
extra-heavy-duty series with ¾-in. sq. drive; and $\frac{3}{8}$ to 1 in. double square, in the standard series with ½-in. sq. drive.

Gaging, Inspecting and Testing Equipment

Gage, "Electrolimit"

Pratt & Whitney Co., Hartford, Conn. [Vol.75,p.82.] 18.

The Electrolimit gage is applicable to quantity production. It consists of a small gaging head which carries a pointer to contact the work. Movement of this pointer changes the balance of the electric circuit, so that errors from true size are indicated by a needle traveling over the scale of an indicating instrument. Electrical magnifica-

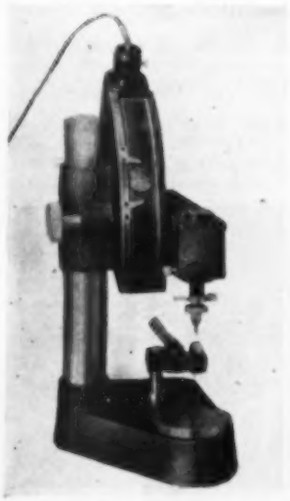


tion from 500 to 10,000 times is possible, so that the gage can be used for a wide range of limits. The length of the scale is 5 in. The Electrolimit gage has been used in selecting machined materials into groups on a 0.0001-in. basis.

Gage, Limit, Indicating

George Scherr Co., 128 Lafayette St., New York, N. Y. [Vol.75,p.575.] 196.

Accuracy of reading and high working speed are the features of the Zeiss Optotest indicating limit gage. The operating principle is that of translating the movement of a contact plunger into a corresponding tilting of a mirror, which reflects the image of a brightly lighted mark onto a large stationary scale graduated to 0.0001 in. and 0.00005 in. The instrument is provided

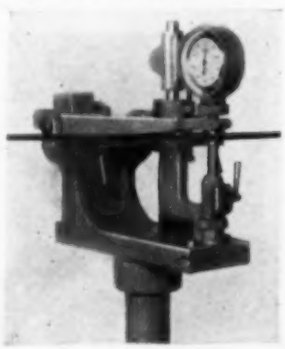


with two adjustable limit hands. Work up to 6 in. high may be gaged.

Gage, Wire, Model 493

Federal Products Corporation, Providence, R. I. [Vol. 75,p.190.] 31.

The dial of this gage is graduated in thousands with a range from 0 to 0.2 in. The

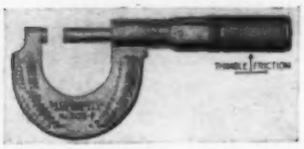


indicator is inclosed in a dust-proof auxiliary housing, and the anvils are interchangeable.

Caliper, Micrometer, Thimble-Friction, No. 203F

L. S. Starrett Co., Athol, Mass. [Vol.75,p.900.] 326.

A friction-stop mechanism eliminates the inconvenience of reaching beyond the thimble to operate the stop. Since the stop disengages at exactly the

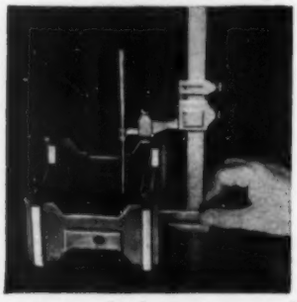


same pressure each time, the operator is assured of uniform contacts. Range of the instrument is 0 to 1 in. by thousandths or, for an extra charge, by ten-thousandths.

Depth Gage Attachments, Nos. 585A and 585B

Brown & Sharpe Mfg. Co., Providence, R. I. [Vol.75,p. 359.] 97.

Depth gage attachments Nos. 585A and 585B for use with vernier height gages No. 585 in both the 10- and 18-in. heights



have recently been announced. Application of the attachment to the vernier height gage quickly converts this tool into an accurate depth gage.

Tables for Micro-Indicator Stand

R. Y. Ferner Co., Investment Bldg., Washington, D. C. [Vol. 75,p.435.] 102.

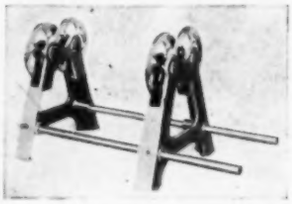
A modification of micro-indicator stand U-3 comprises a

V-block as the table, adapting it to the support of small cylindrical pieces from ¼ to 2 in. Pieces up to 6 in. can be checked on a large flat table of 4½ in. diameter. An adjustable square is also furnished for attachment to the column of the stand and serves as a stop.

Balancing Stand

Sundstrand Machine Tool Co., Rockford, Ill. [Vol.75,p.190.]

This balancing stand has balanced knife-edge steel disks mounted on hardened steel spindles, which revolve on steel balls inclosed in hardened and ground races. A ⅜-lb. disk can be thrown out of balance



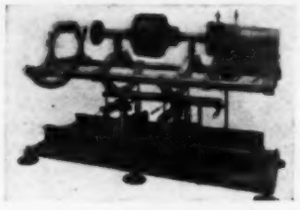
with a 5-grain weight on a 3-in. radius. The tool swings 22 in., maximum distance between standards is 20 in., capacity is 12 lb., and weight of the equipment is 40 lb.

Balancing Machine, Static-Dynamic, Electric-Spark, Style S

Tinius Olsen Testing Machine Co., 500 North 12th St., Philadelphia, Pa. [Vol.75,p. 646.] 228.

This Style S electric-spark machine is suitable for dynamically balancing parts weighing from 125 to 1,000 lb. Other sizes will balance rotors weighing from 4 to 15,000 lb.

The amount of unbalance in



the rotor is determined by adjusting, while the machine is in motion, an artificial unbalance weight until it is exactly equal in amount and opposite to the angle of unbalance in the rotor. Two readings are taken, one at either end, so that a corrective dynamic couple can be applied to the part being balanced. More details are also found on p. 1021, Vol. 73.

Balancing Machine, Dynamic

Globe Tool & Engineering Co., Dayton, Ohio. [Vol.75,p. 720.] 271.

The equipment is available in sizes to balance work from 1 in.

to 96 in. in diameter, and to accommodate weights as low as ¾ oz. or up to 2,000 lb. It employs neon light to locate the point of unbalance, and the amount of unbalance is found automatically at the time the location of unbalance is determined.

Bench Centers, Improved

Taft-Peirce Mfg. Co., Woonsocket, R. I. [Vol.75,p.830.] 300.

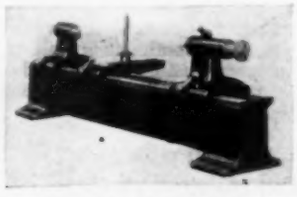
These improved bench centers for inspection purposes have maximum length between centers of 36 in. and a swing of 8 in. The bed working surface is

ground, and a T-slot aligns the head and tailstocks and provides means for clamping them. A heavy beam section removes all tendency for the bed to spring.

Bench Center

Barber-Colman Co., Rockford, Ill. [Vol.75,p.975] 358.

The headstock and tailstock of this inspection device are independently adjustable. The tailstock has a spring-loaded center, which may be clamped



while a piece is held between centers. The slide, or indicator base, is provided with a vertical post, which may be moved to any position in or out between centers, and is intended for use in holding a dial indicator.

Cam Checking Device, Optical

Geo. Scherr Co., 128 Lafayette St., New York, N. Y. [Vol. 75,p.397.] 118.

The outfit consists of a scraped surface plate with two parallel T-slots, an optical dividing head and tailstock, and a measuring microscope. The camshaft is taken between centers, and the angular setting secured from the optical dividing head. The reading may be taken directly to one minute of arc. Rise and fall of the cam for each angular setting is secured by means of the

measuring microscope. The reading is obtained directly from a scale. Distance between centers can be up to 60 in.

Dynamometer, "Triplex"

Robert Miller, 221 No. 23rd St., Philadelphia, Pa. [Vol. 75,p.327.] 78.

This "Triplex" dynamometer for testing diamond wire-drawing dies indicates accurately the traction required to draw a wire through the die. It may be set so that the indicator hand re-

mains at the maximum reading, allowing ultimate break-down tests. The unit contains three scales, the finest of which reads in hundredths of a pound. The middle scale reads from 0 to 10 lb. and the largest from 0 to 100 lb.

Gear Checking Fixture, Spiral-Lead

Michigan Tool Co., 7171 Six Mile Road, E. Detroit, Mich. [Vol.75,p.395.] 69.

This spiral-lead checking fixture will handle spiral gears up to 16 in. in diameter and with any lead of 10 in. or over, either right or left-hand. The gear is mounted on a stub arbor or between centers up to 12 in. in length. The fixture is of the sine bar type. Mounted on top and toward the sides of the gear carriage are two lapped surfaces which drive the work

spindle by contacting two friction rolls. These rolls cause the spindle to rotate in timed relation with the movement of the carriage on which the indicator is mounted.

Checking Device, Helical-Gear

National Tool Co., West 112th St. & Madison Ave., Cleveland, Ohio. [Vol.75,p. 830.] 291.

This device is shown attached to the Model "B" gear checking machine, and may also be attached to the Model "C" ma-

chine. In addition, it is furnished as a bench type, or mounted upon a pedestal stand.

The helical gear is mounted upon a stub shaft carried by a slide, which is moved so that the teeth of the gear engage the teeth of the rack. The reading of the angle thus established is taken direct from the large drum.

The device will check right- or left-hand helical gears. When mounted on a pedestal, the device may be placed in the production line to permit 100 per cent inspection.

Microscope, Micrometer, Société Genevoise

R. Y. Ferner Co., 1129 Investment Bldg., Washington, D. C. [Vol.75,p.221.] 34.

Model 281-D may be used for checking the profiles of small gears or screw threads. The micrometer screw is fitted and lapped into the bronze nut, while the thrust bearing of the screw is a sapphire ground optically flat to eliminate periodic error.

Micrometer-drum divisions permit estimates of a tenth of a division, or 0.000005 in. To obtain the complete reading it is merely necessary to set down successively the numbers indicated on the turn counter and the micrometer head. The eyepiece can be placed over the center of the desired field

to reduce distortion of the image. Total magnification is 41.5, 63, or 96 times.

Reverse Bending Machine, Warner

Tinius Olsen Testing Machine Co., 500 North 12th St., Philadelphia, Pa. [Vol.75,p.716.] 229.

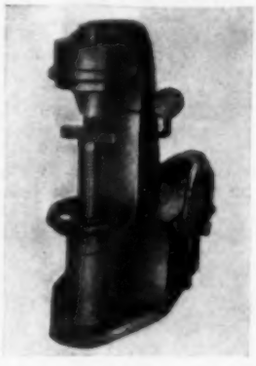
Operation of the machine consists in bending a specimen back and forth over definitely shaped jaws so that smooth

bending in opposite directions is alternately effected. This is done with the handwheel.

Hardness Tester, Brinell, Motor-Driven

Tinius Olsen Testing Machine Co., 500 North 12th St., Philadelphia, Pa. [Vol.75,p. 719]. 227.

Provision is made by means of a lever device on the side



to permit operating by means of a treadle. Foot operation is effected by adjusting a rod running downward from the segment on the lever. All rotating parts are completely inclosed and run in oil.

Hardness Tester, Portable, "Duroskop"

R. Y. Ferner Co., 1129 Investment Bldg., Washington, D. C. [Vol.75,p.792.] 290.

This instrument is portable. Tests can be made rapidly, since the entire procedure consists of holding the Duroskop against the piece to be tested and pressing a button on the back of the case to release the pendulum. The pendulum strikes through a hole in the edge of the case against the

workpiece and, in rebounding it carries with it a light pointer which remains at the highest point on the scale to which the pendulum rises. Material less than 0.002 in. thick can be successfully tested. The instrument weighs 13 ounces.

Testing Instrument, Grinding-Wheel, "Grade-O-Meter"

Abrasive Engineering Corp., Div. of Simonds Saw & Steel Co., 2842 W. Grand Blvd., Detroit, Mich. [Vol.75,p.903.] 311.

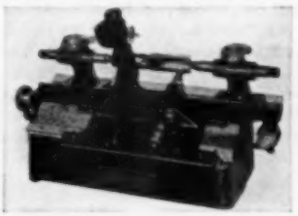
The Grade-O-Meter is an instrument for mechanically testing the strength of the bond of grinding wheels, honing stones,

grinding segments, emery blocks and other abrasive products. The instrument substitutes a scientific method for testing the strength of the bond as contrasted to the usual hand method employed in shops. The apparatus can be used to grade, classify or standardize various kinds of grinding wheels, and to indicate from definite units the true grade at various points.

Testing Instrument, Lead

Detroit Tap & Tool Co., Detroit, Mich. [Vol.75,p.939]

Measurement is made by means of a spiral micrometer and microscope, supported on a carriage and focused on an optical scale. The carriage is fitted with a spring-loaded



plunger, carrying at its extremity a removable ball point, which engages two adjacent threads of the piece. This plunger mechanically locates the carriage. Maximum error does not exceed a total of 0.00018 in. for the 8 in. length.

Testing Machine, Ductility

Tinius Olsen Testing Machine Co., 500 North 12th St., Philadelphia, Pa. [Vol.75,p.758.] 226.

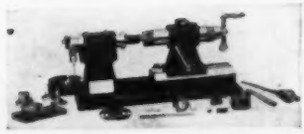
The motor drive for this machine is smooth in operation, the power being applied and the load weighed hydraulically. Thickness of the specimen is shown by the graduated scale

under the handwheel. At all times during the test, the depth of cup and the amount of load applied are indicated. A stop is provided so that the increase in load is stopped automatically for any desired depth of cup. The load can be applied again instantly by a lever so that it increases up to the specimen fracture.

Testing Machine, Torsion-Spring, "Torsiometer"

Coats Machine Tool Co., Inc., 110-112 West 40th St., New York, N. Y. [Vol.75,p.977]

In the line of torsion spring testing machines offered for testing such springs when they are mounted on their arbors, the

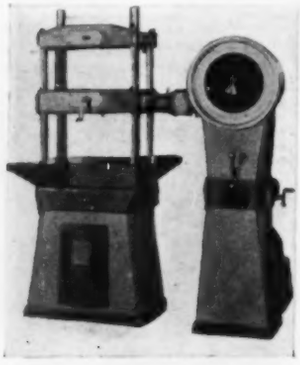


headstock spindle has a flange with dog for connecting with the spring end, and the outer end is fitted with a weigher beam and scale. The tailstock spindle is used to twist the spring through the required angle against the resistance of the weight arm. The spring may be weighed or tested in the process of loading or unloading; that is, the moment of torsion which a partially loaded spring will exert against further tensioning, or the moment to prevent the spring from uncoiling.

Testing Machine, Universal, Hydraulic

Riehle Bros. Testing Machine Co., 1424 North Ninth St., Philadelphia, Pa. [Vol.75,p.506]. 155.

Among the features of the machine are: single lever control; self indication; dual load range on a single dial; instant

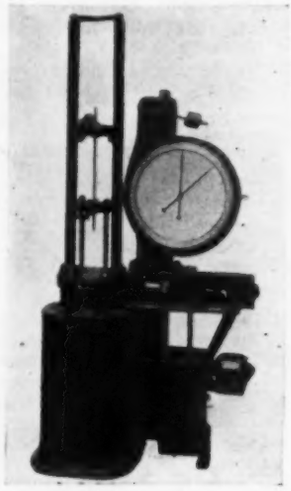


load range transition; instant locking and self-releasing grips; convenient location of motor switches; wide space between screws; convenient storage space, head travel indicator; instant changing tools and grips; sensitive speed control; quiet operation; flexibility of setup, and an open-scale, easily read dial. The machine is manufactured in five sizes in capacities up to 400,000 lb.

Testing Machine, Universal, Hydraulic

Tinius Olsen Testing Machine Co., 500 N. 12th St., Philadelphia, Pa. [Vol.75,p.757]. 284.

The loading system consists of a hydraulic cylinder and piston located in the base, the piston being connected to the



four straining rods and terminating at the moving crosshead. As the pressure is increased in the cylinder, the lower crosshead moves down, tension load is applied through the specimen to the upper adjustable crosshead, and then downward through the two side columns to the weighing table, which rests on knife edges. Through a system of levers the load is transmitted to a pendulum at the rear of the dial. One pointer follows the load constantly, but the second pointer always indicates the maximum load which has been applied.

Electrical Equipment

Motor, Totally Inclosed, Fan-Cooled

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. [Vol.75,p.434.] 134.

This motor is for use in Class I, Group D, hazardous locations. Free passage of cooling air is

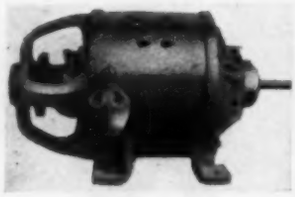
assured because of the large air passages and large spaces between the guard and the non-sparking type aluminum alloy fan.

Bearings are of cartridge type. The prewound primary core is interchangeable and renewable.

Motors, D.C., Small

Reliance Electric & Engineering Co., Cleveland, Ohio. [Vol.75,p.575.] 197.

This line of small d.c. motors supplements the larger Type T heavy-duty motors. Sizes are from ½ hp., 1,750 r.p.m. to 3 hp., 1,750 r.p.m. for constant- or adjustable-speed operation. They



are provided with ball or sleeve bearings, and may be had in open, semi-inclosed or fully inclosed models. A feature is the refillable-type commutator.

Motors, Vertical, D.C.

Reliance Electric & Engineering Co., Cleveland, Ohio. [Vol.75,p.289]. 56.

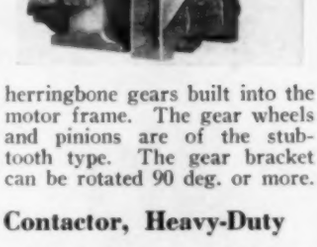
The Type T, d.c. motor for vertical application is built in sizes up to 50 hp., 1,150 r.p.m., and is provided with a ring

base for mounting and a drip cover to protect it from falling dirt and water. The motor can also be mounted directly on the machine without the ring base.

Motors, "Slo-Speed"

Sterling Electric Motors, Inc., Telegraph Road at Atlantic Blvd., Los Angeles, Calif. [Vol.75,p.900]. 329.

"Slo-Speed" motors comprise the company's standard motors, the speed of which is reduced by means of inclosed helical or



herringbone gears built into the motor frame. The gear wheels and pinions are of the stub-tooth type. The gear bracket can be rotated 90 deg. or more.

Contactor, Heavy-Duty

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. [Vol.75,p.393.] 66.

This heavy-duty contactor for crane, steel mill and general

purpose d.c. magnetic controller is compact and has fast-opening contacts. The bearing pins of the armature and contact arm are of nitrided alloy steel.

Controllers, Treadle-Operated

Allen-Bradley Co., 1311 South First St., Milwaukee, Wis. [Vol.75,p.866]. 230.

Bulletin 500, treadle-operated controllers provide a convenient means for a smooth control of speeds of small tools required

to be driven by d.c. or universal motors. Operation of the treadle compresses a graphite-disk compression resistor to give infinite variation of the speed.

Control Station, Explosion-Proof

Square D Co., Industrial Controller Div., Milwaukee, Wis. [Vol.75,p.865] 321.

Class 9001, Type BR-11, explosion-proof control stations are of the three-wire, momentary-contact type provided with one normally open and one normally closed contact inclosed in a cast-iron housing to withstand an explosion.

Speed Regulator, Face-Plate

Allen-Bradley Co., 1311 South First St., Milwaukee, Wis. [Vol.75,p.679.] 218.

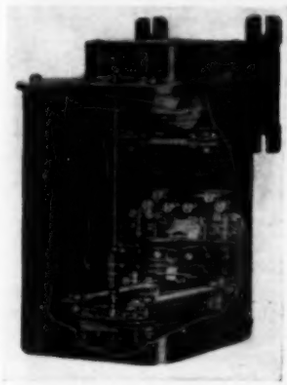
Bulletin 555 speed regulator of the face-plate type is employed for varying the resistance in the secondary circuit of slipring motors up to 25 hp. Disconnection of the motor makes it necessary to move the lever back to the first position to pick up the primary

switch, thereby preventing starting without all resistance in the three phases.

Starter, Across-the-Line, A.C.

Cutler-Hammer, Inc., 205 No. 12th St., Milwaukee, Wis. [Vol.75,p.358.] 105.

Distinguishing this starter from similar explosion-proof equipment is the immersion in oil of its thermal overload mechanism. Contacts open under



a 6-in. head of oil. A float-operated indicator shows the oil level. Threaded conduit openings and a compound-filled junction box are included.

Starter, Across-the-Line, No. 2, Type ZO

Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland, Ohio. [Vol.75,p.400.] 117.

This No. 2 unit is self-contained and totally-inclosed in a pressed steel case with oil-immersed main and control circuit contacts and vapor-proof overload relays. Two thermal-type overload relays are used. These

elements are arranged to be easily changed so that a No. 2 Type ZO starter of one rating can be quickly converted to one of another horsepower.

Starter, Class 2510-W5

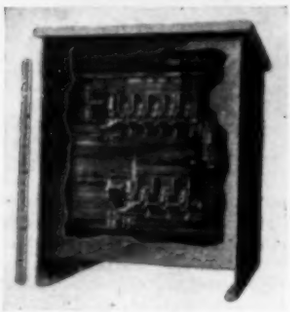
Square D Co., Industrial Controller Div., 210 South Third St., Milwaukee, Wis. [Vol.75, p.681.] 256.

This three-pole starter is designed to control across-the-line single and polyphase motors of 2 hp. or less. It is particularly applicable to machine tools and general applications where remote control and low-voltage protection are not essential. Overload protection is provided by time-limit thermal relays.

Starter, Auto-Transformer Type

Cutler-Hammer, Inc., 205 North 12th St., Milwaukee, Wis. [Vol.75,p.538.] 172.

This oil-immersed, explosion-proof automatic starter for squirrel-cage motors is designed for Class I, Group D hazardous installations. The starter panel



consists of a three-pole and a five-pole contactor mounted on a slate panel and interlocked. The auto transformer and overload relays are mounted at the rear.

Starters, Explosion-Proof

Square D Co., Industrial Controller Div., 210 South Third St., Milwaukee, Wis. [Vol.75, p.863.] 322.

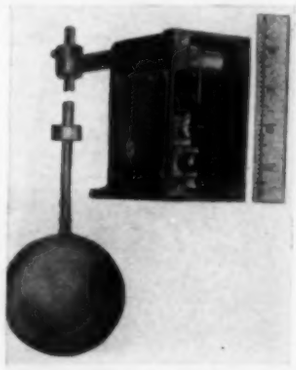
Class 8532, Types AR-1 and BR-1 explosion-proof starters

are for use in Class 1, Group D hazardous locations. The starter mechanism consists of a three-pole, magnetic contactor and thermal overload relays mounted on a porcelain base. An explosion-proof, cast-iron inclosure surrounds the starter mechanism. The starters provide low-voltage protection and release, and also time-limit overload protection to a.c. single and polyphase across-the-line motors.

Starter, Float-Operated

Cutler-Hammer, Inc., 205 No. 12th St., Milwaukee, Wis. [Vol. 75,p.392.] 104.

For small a.c. and d.c. motors on sump pumps, open tanks and similar applications, this float-operated motor starting switch provides across-the-line starting, thermal overload protection,

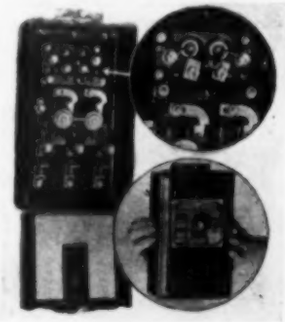


and is small in size. It can also be furnished without the float accessories for use as a lever-operated master switch. Maximum ratings are: a.c., ½ hp., 110 or 220 volts, single phase; d.c., ¼ hp., 115 volts.

Starters, Manual

Cutler-Hammer, Inc., 205 North 12th St., Milwaukee, Wis. [Vol.75,p.541.] 178.

Bulletin 9115 three- and four-pole types, across-the-line "X" manual starters have been redesigned to incorporate thermal



overload relays in place of the thermal overload cutouts formerly supplied. Should an overload occur, the overload relay trips, opening two lines to the motor so that the entire circuit is opened. There is nothing to renew.

Starter for Squirrel-Cage Motors

Allen-Bradley Co., 1311 S. First St., Milwaukee, Wis. [Vol.75,322.] 35.

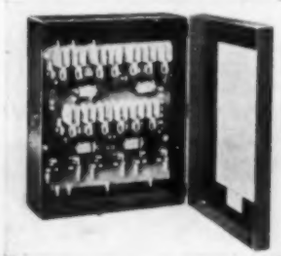
The Bull. 710 WT across-the-line starting switch is for use in places where a splash-proof starter is necessary. It is rated for squirrel-cage motors up to

and including 100-hp., 220 volts, and 200-hp., 440-550 volts. On slip-ring motors it serves to control the primary circuit.

Switches, Automatic, for Multi-Speed Motors

Allen-Bradley Co., 1311 South First St., Milwaukee, Wis. [Vol.75,p.645.] 217.

Bulletin 715 automatic, multi-speed, across-the-line switches are for two-, three-, or four-speed, non-reversing service, in connection with two- and three-



phase, multi-speed motors of consequent-pole-winding or separate-winding type, in ratings up to 40 hp., 220 volts, and 75 hp., 440-550 volts, 25 to 60 cycles.

Switches, Drum Reverse

Allen-Bradley Co., 1311 South First St., Milwaukee, Wis. [Vol.75,p.615.] 219.

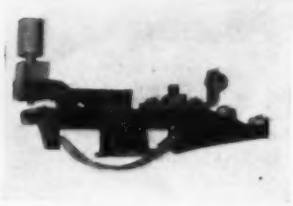
Bulletin 350 drum reverse switches are for across-the-line

reversing of a.c. and d.c. motors and for reversing service in connection with magnetic starters. Maximum a.c. ratings are 5 hp., 110 volts; 10 hp., 220 volts; and 15 hp., 440-550 volts, or d.c. up to 3 hp., 115 volts, and 5 hp., 230 volts.

Switch, Thermostatic, Snap, 1000-Watt, A.C.

Robbins & Myers, Inc., Springfield, Ohio. [Vol.75,p. 325.] 65.

This easily applied switch maintains any desired temperature up to 525 deg. F. with a maximum variation of 5 deg., and occupies from ⅓ to ½ less



space than the ordinary switch. It has but two moving parts. The circuit-breaking spring is of special steel. A special low-temperature type having a differential of but 2 deg. is also available.

Attachment Cap, Rubber, with Hand Grip

Cutler-Hammer, Inc., 205 North 12th St., Milwaukee, Wis. [Vol.75,p.719.] 261.

This unbreakable attachment cap with hand grip is made of soft, resilient rubber with the

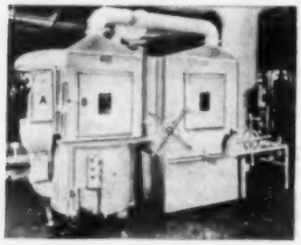
blades fastened to a Bakelite disk imbedded in the rubber base. The hand grip is approximately 1¾ in. long.

Furnaces and Equipment

Furnace, Cyanide-Hardening, Automatic, Improved

Parker-Kalon Corp., 200 Varick St., New York, N. Y. [Vol.75,p.648.] 221.

Among improvements incorporated in this model is an automatic preheating and loading attachment at the left-hand side. Exhaust heat is concentrated

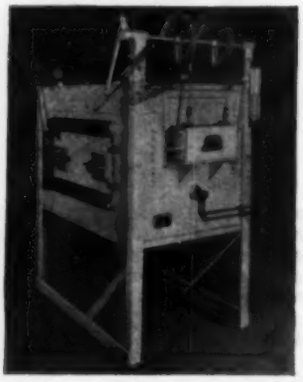


against the bottom of the loading fixture, thereby drying the work before it is emptied into the cyanide basket. This loading fixture pivots on the shaft and allows charging of the furnace with both work and cyanide without opening the doors. It now takes but a few minutes to change a 3-compartment furnace over, so that it may be used for either basket or racked work.

Furnace, Electric-Conveyor

C. I. Hayes, Inc., Providence, R. I. [Vol.75,p.394.] 112.

This conveyor furnace is for production hardening of small tools or parts made of carbon or alloy steels. The furnace is sealed at the delivery end by means of a chute which extends



below the surface of the quench. It is sealed at the entrance by the standard "Certain Curtain" atmosphere control system. On the left side of the furnace is the apparatus for driving the conveyor belt at a range of speeds. The operating temperature is up to 1,650 deg. F.

Furnace, Electric, Vertical

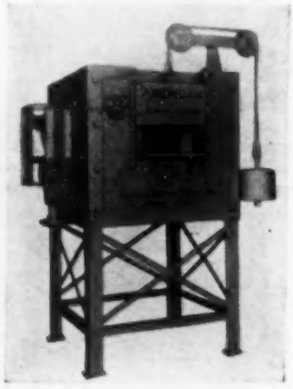
American Electric Furnace Co., 27 Von Hillern St., Boston, Mass. [Vol.75,p.435.] 131.

This furnace is designed for heat-treating broaches at temperatures up to 2,500 deg. F., and has Globar-type elements. The effective heating chamber is 8x12x72 in. deep. The rating is 100 kw., 220 volt, 3-phase, 50 cycles. To obtain a uniform temperature throughout the interior of the furnace, the heating elements are connected for three overlapping heating zones with two control instruments. An atmospheric control is fitted to eliminate oxidation, scale and pitting.

Furnace, High-Speed, Model HB-10

American Electric Furnace Co., 27 Von Hillern St., Boston, Mass. [Vol.75,p.681.] 233.

This furnace is equipped with four horizontal Globar heating elements, two above and two



below the heating chamber. These are equipped with water-cooled terminals. The furnace is also fitted with a patented atmospheric control. Operating range extends to 2,500 deg. F. Working area of the chamber is 8 in. wide by 12 in. deep by 5 in. high.

Furnace, Electric, Rivet and Small Parts

Ryan, Scully & Co., 3711 Wissahickon Ave., Philadelphia, Pa. [Vol.75,p.223.] 43.

Although originally developed for heating of alloy rivets, the furnace, with the introduction

of the high-temperature Globar unit, in high-temperature models is suitable for heating small quantities of stock for forging. All furnaces of the lower temperature rating are supplied with a metal hearth plate split in two sections. This allows for one charge being worked in one side without affecting the heated work in the other section.

The low-temperature furnaces are available in four sizes for temperatures up to 2,000 deg. F., and the high-temperature furnaces in three sizes for work up to 2,500 deg. F.

Furnace, Tube, High-Temperature, Model V

Sentry Co., Taunton, Mass. [Vol.75,p.611.] 209.

This furnace will give a maximum temperature of 2,252 deg. F. and may be used for small tool hardening. The porcelain tube has a 1-in. bore and an

8-in. heated portion. Heating elements are of silicon carbide, and terminals are air-cooled. A thermo-couple hole ¼ in. diam. is provided. Maximum electrical demand is 2¼ kw.

Furnace, Pot, Model P-31

American Electric Furnace Co., 27 Von Hillern St., Boston, Mass. [Vol.75,p.680.] 232.

A heating element formed of one continuous helical coil is used in the Model P-31 pot furnace. It is retained in place in spiral grooves in the heating ele-

ment tile. The outer shell is of heavy steel plate supported on an annular cast-iron base ring. A patented double flange on the pot fits into and over a groove in the supporting ring. Diameter of pot, 10 in.; depth, 18 in.; kw. consumption, 18, capacity of steel per hr. to 1,500 deg. F., 150 lb.

Heater, Tire

Thomson-Gibb Electric Welding Co., Bay City, Mich. [Vol. 75,p.541.] 170.

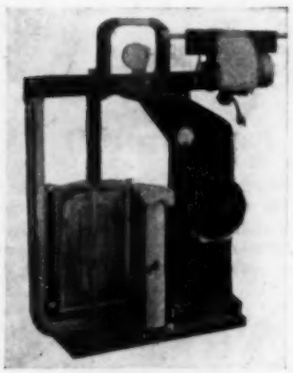
An air-operated induction heater for rings, tires, and all shapes which can be clamped or assembled into a circular structure, has been announced. The heat is generated in the

work itself, and electrical energy is used only when the heater is loaded. The heater can be used on steel and cast iron and is available in sizes from 50 to 500 kva.

Dilatometer, Model LB

Stanley P. Rockwell Co., 296 Homestead Ave., Hartford, Conn. [Vol.75,p.573.] 181.

The Rockwell Model LB Dilatometer, combining the features of the former Model LA for securing critical transformations of metals during heating and cooling with the new feature of accurate determination of coefficients of expansion, has been produced. The Model LB allows the investigator to quench the work in any medium, and then secure the dilatometric-temperature curves during the cooling

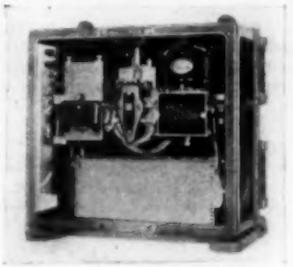


range. This model has its field of usefulness in determining the proper heating rate to employ to control final shrinkage or expansion in the finished work.

Pyrometer, Potentiometer, "Micromax"

Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa. [Vol.75,p.611.] 214.

Micrometer sensitivity, automatic standardization, and rapid recording are features of the "Micromax" potentiometer pyrometer. The instrument cir-



cuit is standardized automatically every 45 min. or less, giving a closer adjustment than is obtained manually. The rapid recording feature is of value especially in automatic control, and where more than one temperature is being measured.

used as a tractor or crane as it can travel with its load.

Hoist, Chuck, Hand-Operated

Economy Engineering Co., 2653 West Van Buren St., Chicago, Ill. [Vol.75,p.540.] 173.

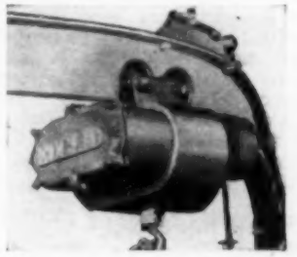
This hoist may be moved easily in congested places. The top of the boom is 6 ft. 4 in. above the floor, thus enabling

the chuck to be raised high enough for any ordinary lathe. The saddle for the chuck is 6 in. in width and large enough to accommodate chucks weighing up to 200 lb.

Hoist, Electric, Type 12

Euclid-Armington Corporation, Euclid, Ohio. [Vol.75,p. 221.] 39.

The Type 12 hoist is manufactured in ½-, 1-, 2- and 3-ton capacities. Every shaft rotates on Hyatt bearings. The standard 1-ton model brings the hook to within 18 in. of the underside of the I-beam, but a special hoist is available for



8½-in. clearance. The load can be lowered only by reversing the motor. An improved brake stops the motor instantly when the controller is returned to neutral.

Hoists, Electric-Trolley

Wright Mfg. Co., Bridgeport, Conn. [Vol.75,p.253.] 46.

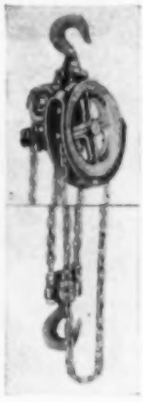
These plain, geared and motor-driven trolley hoists have bearings for the trolley wheels designed to absorb both radial and thrust loads. In the motor-driven trolleys, the wheels are

driven on each side of the I-beam to insure smooth operation. Controllers for single-speed, two-speed, or variable-speed operation can be furnished. While the standard lift is 18 ft., lifts of 9 and 36 ft. can be furnished.

Hoist, Model 30

Wright Mfg. Co., Bridgeport, Conn. [Vol.75,p.577.] 194.

The Model 30 hoist is lighter, more compact and more efficient than the ordinary hoist. It is designed on the worm-wheel principle, has few parts, and holds the load securely at any point. Features include: special analysis steel load chain, electrically welded, heat-treated and proof-tested; and heat-treated, drop-forged hook.



Truck, "Jak-Tung"

Howe Chain Co., Muskegon, Mich. [Vol.75,p.541.] 143.

The "Jak-Tung" truck for industrial and warehouse use has a body of hardwood or steel, suitably shaped for the product to be handled, and is permanently attached to two rear wheels with a malleable iron leg supporting the front. For use as a hand truck, a jack tongue is inserted in the drawbar. To couple the trucks into a tractor

Material Handling Equipment

Conveyor, Pan-Type

American Manganese Steel Co., Chicago Heights, Ill. [Vol. 75,p.359.] 87.

For use where the pan type conveyor is indicated in handling hot or cold products or materials, a conveyor has been developed of all-manganese steel or all Fahralloy, depending on whether the service is cold or not, with the following major

design elements: smooth apron surface, with or without side flanges, and with or without floor and side flange overlap; chains have one-piece links; liberal pin surface, and knee-type joints, which prevent sag between the supporting track wheels. Conveyors are made from 2 ft. to 8½ ft. in width.

Crane, Boom, with Electric Lifting Magnet

Bucyrus-Erie Co., South Milwaukee, Wis. [Vol.75,p.542.]

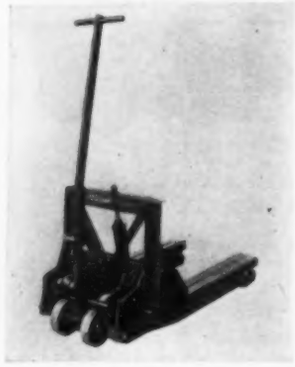
The Loadmaster crane may now be obtained equipped with a 20-in. Ohio magnet for handling scrap iron and small castings. The machine has a full-revolving boom, and can be

train, the jack tongue is removed and the trailer hitch inserted in its place.

Truck, Lift, for Tin-Plate

Barrett-Cravens Co., 101 West 87th St., Chicago, Ill. [Vol.75,p.40.] 14.

This fork-type lift truck has a platform 3¼ in. high to go under stacks of tin-plate, which are usually shipped on 2x4's.



A pile of tin-plate can be lifted and trucked as a unit by this means, as can other material similarly shipped.

Truck, Lift, Chisel-Type

Elwell-Parker Electric Co., Cleveland, Ohio. [Vol.75,p.540.] 167.

The Type ERN elevator-chisel truck has capacity of 6,000 lb. The forks are made in various lengths and with varying spreads to accommodate

any material from black sheets to finished products. The forks may be tilted back 30 deg. in an inclined position so as to carry the load safely to the destination, where it may be elevated 5 ft. for tiering.

Truck, Tiering, "Tructier"

Clark Tructractor Co., Battle Creek, Mich. [Vol.75,p.471.]

This hydraulic tiering truck steers with all four wheels, drives from the rear wheels and

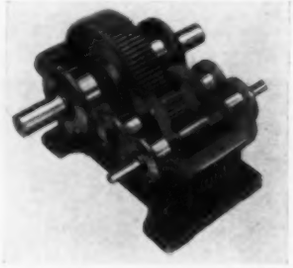
is powered with a tractor-type gas engine. The turning radius is 94 in. The "Tiertop" model tiers a 3-ton load to 6 ft. in 30 sec. The "Tiermor" model tiers 3 tons to 4 ft. in 18 sec. and, due to its low over-all height, is especially adapted to loading and unloading freight cars.

Transmission Equipment

Speed Reducers, Herringbone-Maag

W. A. Jones Foundry & Machine Co., 4401 West Roosevelt Road, Chicago, Ill. [Vol.75,p.82.] 6.

Capacities range up to 18 hp., and the reduction ratios from 12 to 1 up to 48 to 1. The smallest reducer in this series is 20 5/16 in. long and 14¼ in. high,

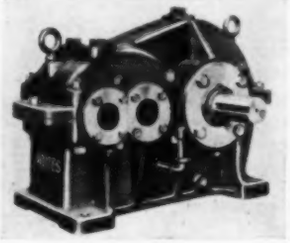


and the base measures 10¼ in. wide. For universal application all reducers have high- and low-speed shaft extensions on both sides. High-speed gears are herringbones; low-speed, Maag spur tooth.

Speed Reducers, Herringbone-Maag, 90-D and 105-D

W. A. Jones Foundry & Machine Co., 4401 West Roosevelt Road, Chicago, Ill. [Vol.75,p.332.] 72.

This series of double-reduction Herringbone-Maag speed reducers for small motor drives has double helical gears, generated right- and left-hand in effect a herringbone gear with

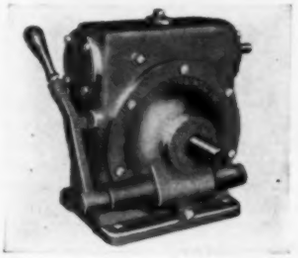


a wide gap, and used for the initial, or high-speed, reduction. The low-speed reduction consists of a Maag pinion and gear. Timken bearings are used throughout. Horsepower ratings vary from 0.9 to 2.8 for the 72-1 ratio unit, and from 5.2 to 8 for the 12-1 ratio unit.

Speed Reducer, Worm-Gear, Two-Speed

Gears & Forgings, Inc., Cleveland, Ohio. [Vol.75,p.645.]

Designed for either horizontal or vertical drives of ½ hp. and up where two speeds are required, this worm-gear reduction unit is manufactured integral with the motor or as a separate unit in ratios from 4:1 to 150:1.



The two speeds are obtained by means of differential gearing. The high speed is obtained by moving the hand lever to the right.

Speed Reducer Housings, Welded-Steel

Philadelphia Gear Works, Erie Ave. & G St., Philadelphia, Pa. [Vol.75,p.187.] 19.

The speed reducer units manufactured by the above company are now available with housings made of welded steel

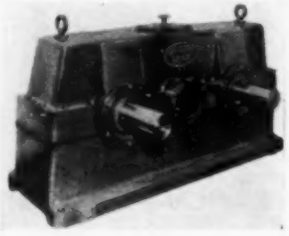


plate. Speed reducers so housed are smooth-running, quiet in operation, and afford longer gear life by cutting vibration.

Reduction Unit, Worm Gear, Size 70

Cleveland Worm & Gear Co., 3258 E 80th St., Cleveland, Ohio. [Vol.75,p.938] 335.

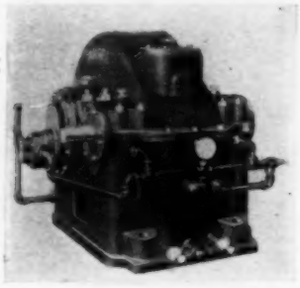
The Size 70 worm gear reduction unit transmits up to about 7½ hp. The unit is furnished in both horizontal and

vertical types. All shafts are mounted in anti-friction bearings. The worm and its shaft are made from a single nickel-alloy steel forging, and the gear is hobbed from a solid nickel-bronze blank. The nine standard ratios vary from 4 5/8:1 to 60:1.

Gear Units, High-Speed

Farrel-Birmingham Co., Inc., Buffalo, N. Y. [Vol.75,p.682.]

Gear units have been developed for speeds up to 6,000 r.p.m. and powers from 120 to 2,500 hp., with ratios up to 10

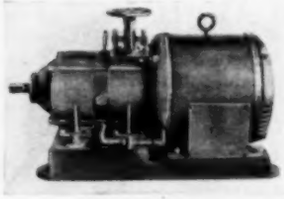


to 1 for either increasing or reducing speed. Gears used are the Farrel-Sykes herringbone, continuous-tooth type. A complete lubrication system is provided, together with an oil cooler.

Transmission, Electro-Hydraulic, 5-Hp., "Hele-Shaw"

American Engineering Co., Philadelphia, Pa. [Vol.75,p.504.] 123.

This transmission will develop full-rated torque at any speed. Since the torque is constant the horsepower output varies with



the speed of the hydraulic motor. At maximum speed the transmission will develop 5 hp. The hydraulic motor is located at the left, the hydraulic pump in the center, and the electric motor at the right. These three units are mounted on a single bedplate oil reservoir. Stroke of the pump is regulated by the handwheel.

Transmission, Variable-Speed, with Electric Control

Reeves Pulley Co., Columbus, Ind. [Vol.75,p.613.] 208.

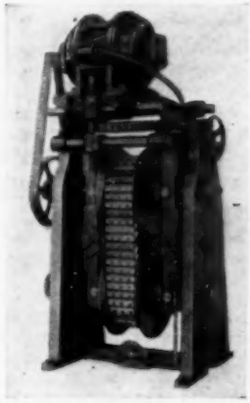
The electric automatic control consists of a fractional-horsepower motor of the reversible-

pilot type, mounted on a bracket above the speed-shifting screw of the standard Reeves variable-speed transmission. It is connected to this screw by spur gears. The motor is energized to run either clockwise or counterclockwise by an automatic control switch incorporating rheostat tubes of the compression graphite-disk type.

Transmission, Vertical, with Pivoting Motor Base

Reeves Pulley Co., Columbus, Ind. [Vol.75,p.646.] 241.

The vertical Reeves transmission is now available equipped with a motor base which is adjustable vertically, in order that



any stretch in the chain or multiple V-belt drive can be taken up. Adjustment is made by a screw.

Transmission, Vertical, Inclosed

Reeves Pulley Co., Columbus, Ind. [Vol.75,p.1006] 372.

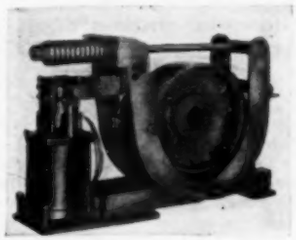
The vertical inclosed transmission of small floor space in-

corporates the standard internal operating parts of the Reeves variable-speed drive. All shaft and thrust bearings are lubricated through force-feed fittings located in two convenient exterior panels. This transmission may be equipped with electric remote, electric automatic, and mechanical automatic controls.

Brakes, Shoe-Type, Thrustor

General Electric Co., Schenectady, N. Y. [Vol.75,p.1008]

Type CR 9516 shoe-type, water-proof Thrustor-operated brakes are for a.c. motors on mill, crane, hoist and similar applications. These brakes pro-

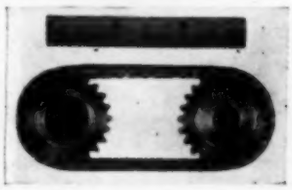


vide quick, cushion-like braking in either direction of rotation with either light or heavy loads, and are adjustable for braking torque. The use of the hydraulic Thrustor minimizes braking-mechanism inertia, shock and noise.

Chain, Silent, 3-16-In. Pitch

Link-Belt Co., 515 Holmes Ave., Indianapolis, Ind. [Vol. 75,p.827] 307.

What is said to be the smallest silent chain drive, this $\frac{3}{16}$-in. pitch chain is made in three types: middle guide, side flanged, and duplex. The mid-

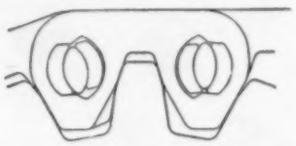


dle guide and side flanged chains are employed where all shafts are driven in one direction, and duplex chains where reverse direction is desired on some shaft or shafts, or where adjustment features are required.

Chain, Silent, "Pumpkin-Seed"

Morse Chain Co., Ithaca, N. Y. [Vol.75,p.432.] 136.

For providing constant angular velocity of the driven shaft, the "Pumpkin-Seed" chain has been developed especially for grinding machines and other machines requiring high precision and no chatter marks on the work. In this chain the lenticular center-pin and the bushings provide two centers of articulation. These centers are so located that the joint will articulate around one center, which moves along the sprocket

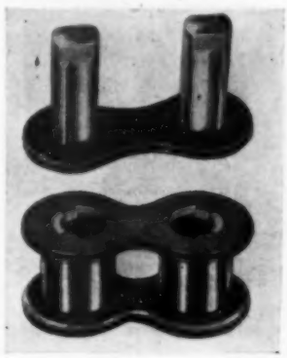


polygon through the first half of flexing, and around the other center, which also moves along the sprocket polygon through the latter half of the flexing. The forward end of the approaching link is caused first to drop below the pitch circle and then rise to it, thus carrying the oncoming strand of chain without rising and falling motion.

Chain, Roller

Morse Chain Co., Ithaca, N. Y. [Vol.75,p.721.] 280.

Within the roller there are two joint members, a segmental bushing and a pin. The cross-section of the pin is that of a



round pin integral with a segmental bushing. Because of this construction, when a chain is flexing on or off a sprocket, all sliding movement of the surface under load is between the pin and its bushing. No movement occurs between the roller and joint members when under load.

Coupling, Small-Series

American Flexible Coupling Co., Erie, Pa. [Vol.75,p.936]

These couplings have maximum bores of $\frac{3}{4}$ in. and 1 in. and are designated as No. 4 and No. 6. The flange sections are diecast, and a wide groove is formed in the face to leave two jaws between which the floating

member slides. Power capacity is 0.05 hp. per 100 r.p.m. for the No. 4 and 0.15 hp. per 100 r.p.m. for the No. 6.

Coupling, Flexible

Penn Machine Co., Johnstown, Pa. [Vol.75,p.322.] 71.

Hardened and ground socket keys sliding in keyways cut in the outer ring fit over balls imbedded in the hub and permit the coupling to compensate for misalignment. The outer ring

connects the two hubs, no matter in what position they may be. The smallest sizes permit $\frac{1}{16}$-in. offset and 6-deg. angular misalignment, increasing with the coupling sizes up to $\frac{1}{2}$-in. offset misalignment. Both shrouded and exposed types are manufactured.

Clutch, Magnetic, Multiple-Disk

Magnetic Mfg. Co., Milwaukee, Wis. [Vol.75,p.325.]

The clutch does not drive through a spring plate or pins, the armature and field do not move relative to each other, and

the entire clutch has no toggles, cams, rollers or yokes. Only one wearing surface, the friction lining, is incorporated, and this lining may be taken up for wear by a single adjustment. Other advantages are: reduced size and installation space.

Gear Drive, Low-Speed, for Bench Machines

B. C. Ames Co., Waltham, Mass. [Vol.75,p.940] 332.

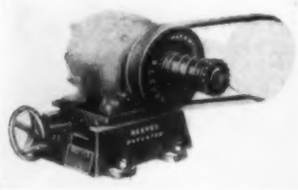
This unit comprises gears and clutches, and is operated with a lever or treadle for supplying individual motor drive to small lathes, milling machines, drills

and miscellaneous equipment. Reverse is obtained by a reversing motor and switch. It shifts from one speed to another while in motion or when idle. The device may be attached under the bench, on the wall, or on the ceiling and requires little space.

Pulley, Variable-Speed

Reeves Pulley Co., Columbus, Ind. [Vol.75,p.645.] 242.

The "Vari-Speed" motor pulley is a simple, compact speed-control unit mounted directly on the motor shaft. The speed control is infinite over a 3:1 range. The unit consists of

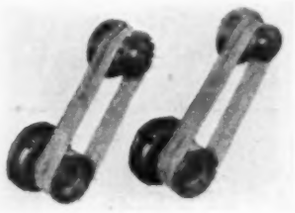


two opposing cone-faced disks, one stationary and one sliding, and an adjustable compression spring, all mounted on the motor shaft, a special motor base with handwheel, and a V-belt forming connection between the disks and the driven pulley. The pulley transmits from fractional to 7½ hp.

Pulley, Variable-Speed

Hammond Machinery Builders, Inc., Kalamazoo, Mich. [Vol. 75,p.579.] 191.

This variable-speed pulley, capable of transmitting up to

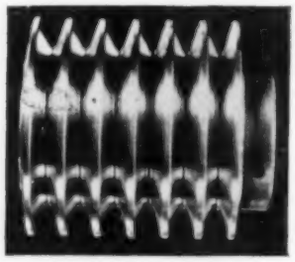


15 hp., has a ratio of 1¼ to 1. The maximum speed recommended is 3,000 r.p.m. It can be used with V-belts. The diameter is increased or decreased to change the speed.

Pulleys, "Wedgbelt"

American Pulley Co., 4200 Wissahickon Ave., Philadelphia, Pa. [Vol.75,p.39.] 13.

Pressed-steel pulleys for V-belt drive afford correct angular relation to the belt and uniform belt stress regardless of the number of grooves. The metal sections insure dissipation of

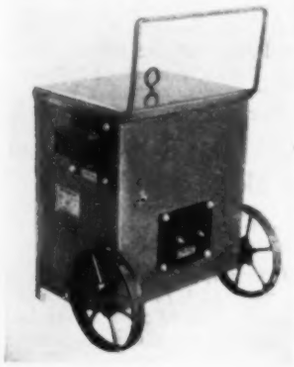


frictional heat, and being non-abrasive reduce the belt wear. In addition, they are naturally balanced.

Welding Equipment

Welder, A.C., 100-Amp., "Flex-Arc"

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. [Vol.75,p.83.] 5.

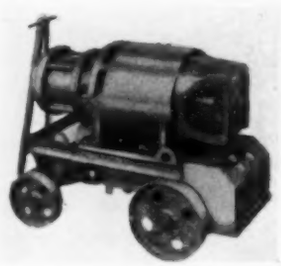


For arc-welding thin-gage material, the "Flex Arc" a.c. 100-amp. welder is designed for operation at between 8.5 and 125 amp. It may be used with bare or coated electrodes from 3/32 to ¼ in. The equipment consists of a special, self-cooled transformer, a short-wave arc control system and current regulating details.

Welding Sets, Type W-D-20

General Electric Co., Schenectady, N. Y. [Vol.75,p.255.] 51.

Single-operator welding sets in 100-, 200-, 300-, 400- and 600-amp. ratings have been placed on the market and include both portable and stationary types. Models are available for operation on either a.c.



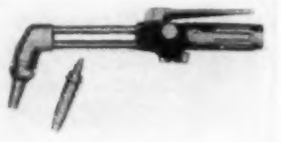
or d.c. at all standard voltages and, in the case of a.c., standard frequencies and 2- and 3-phase gas-engine-driven sets are available.

The sets are self-excited with a tapped series field for major current adjustments and a shunt-field rheostat giving duplex voltage control.

Blowpipe and Cutting Attachment, Type C-105

Linde Air Products Co., 30 East 42nd St., New York, N. Y. [Vol.75,p.189.] 29.

The "Prest-O-Weld" Type C-105 cutting blowpipe and the Type CW-105 cutting attachment, together with the Type W-105 and W-106 welding blowpipes, can be used inter-



changeably with the same detachable valve body. Steel and wrought iron up to 12 in. may be easily cut. The cutting attachment is of single-joint design and attaches directly to the valve body. It will readily cut metal up to 2 in.

Blowpipe, Welding, "Lindewelder"

Linde Air Products Co., 30 E. 42nd St., New York, N. Y. [Vol.75,p.793.] 293.

With the oxy-acetylene welding blowpipe known as the "Lindewelder," the Lindeweld process becomes almost automatic. The device has a rod

holder which feeds the welding rod by gravity. A rod-lifting device controlled by a trigger permits the operator to raise or lower the welding rod as required. A carriage having two adjustable runners supports the blowpipe during the welding operation.

Torch, Cutting and Welding, Type RIF-A

Alexander Milburn Co., 1416-1428 West Baltimore St., Baltimore, Md. [Vol.75,p.254.] 48.

This torch is identical in construction with the Type RI combination cutting and welding torch, with the exception of the

torch head. This head is designed to take conical seated cutting tips Nos. 1 to 8 RIF. The cutting torch can be converted for welding by an adaptor, No. 630, designed to take standard Milburn Type FX welding tips.

Torch and Cutting Attachment, No. 11, "Purox"

Linde Air Products Co., 30 East 42nd St., New York, N. Y. [Vol.75,p.253.] 52.

The Purox No. 11 welding torch, which supersedes the No. 10, is suitable for welding from the lightest sheet metal up to ½-in. plate. The tips are so designed that the head angle can

be adjusted. Tips Nos. 2, 4, 6, 8 and 10 are furnished. The Purox No. 21 cutting attachment is designed for use with the No. 11 welding torch to cut metal up to 2 in. in thickness.

Torch, Cutting, Type CC, "Rego"

Bastian-Blessing Co., 240-258 E. Ontario St., Chicago, Ill. [Vol.75,p.288.] 60.

This torch weighs 46 oz. with tip attached, and its overall length is 20½ in. Close

grouping of the preheat holes and concentration of the preheat flame is claimed to produce a narrow clean kerf. Torch heads are of drop-forged Monel metal, permanently assembled to Monel metal torch tubes. Torches are furnished in four angles, 90, 75, 35 deg. and straight tips, and head and torch tube assembly are interchangeable with any CC torch handle.

Electrode, "Manganweld"

Lincoln Electric Co., 12818 Coit Road, Cleveland, Ohio. [Vol.75,p.83.] 8.

The "Manganweld" electrode, containing 11-15 per cent Mn., produces an air-toughening weld with the structure and qualities of wear-resisting cast manganese steel. A heavy, extruded coating provides a shielded arc. Manganweld, after cold working, attains a Rockwell C hardness of 45 to 50. Electrodes are manufactured in $\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, and $\frac{1}{4}$ in. sizes in lengths of 14-in.

Electrode, Hard-Facing

Lincoln Electric Co., 12818 Coit Road, Cleveland, Ohio. [Vol.75,p.252.] 47.

For building up worn steel wearing surfaces, "Hardweld" electrode has a special coating and contains about 1 per cent of carbon. The weld produced has a tough dense surface of moderate hardness and will resist wear and abrasion. When deposited on straight high-carbon steel and allowed to cool naturally, the hardness of the deposit ranges from 290 to 425 Brinell. The electrode is made in diameters of $\frac{5}{32}$, $\frac{3}{16}$ and $\frac{1}{4}$ in., in lengths of 14 in.

Electrode, Coated, Improved, "Fleetweld"

Lincoln Electric Co., 12818 Coit Road, Cleveland, Ohio. [Vol.75,p.575.] 176.

The electrode insures a higher ductility of weld metal, giving 20 to 30 per cent elongation in 2 in. Tensile strength is increased about 10 per cent, to average between 65,000 and 80,000 lb. per sq.in. High resistance to corrosion is also noted. The electrode is claimed to have little "spattering," and employs the shielded arc. The coating is of special composition. Diameters are $\frac{1}{8}$ to $\frac{3}{8}$ in.

Electrode, Manganese

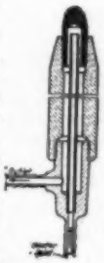
American Manganese Steel Co., Inc., Chicago Heights, Ill. [Vol.75,p.323.] 73.

This welding rod is of a composition designed to attain the essential features of standard, heat-treated manganese steel through-air-hardening alone. The 5 per cent nickel content overcomes any tendency of the metallic manganese to oxidize and prevents embrittlement under slow cooling. The rod is available in the usual range of sizes.

Electrodes, Spot and Seam Welding, "Elkaloy"

P. R. Mallory & Co., 3029 East Washington St., Indianapolis, Ind. [Vol.75,p.431.] 138.

For low-speed and foot-operated resistance welding machines, "Elkaloy" electrode material is unlike "Elkonite," a tungsten-base material, in that it is a copper-base alloy of moderate price. A die life of five times that of copper is claimed. Elkaloy is made in several grades. Its hardness can be varied from 60 to 100 Rockwell B.



Hard Facing Material, "Blackor"

Lincoln Electric Co., 12818 Coit Road, Cleveland, Ohio. [Vol.75,p.680.] 263.

This is a black granular material of tungsten carbide and is applied to tools subjected to abrasive wear in order to do away with the use of insert metals. It is applied with a carbon arc. Blackor maintains its abrasion-resisting quality at red heat. It is fused so that it will bend with the parent metal without flaking off. Scratch hardness is 9 plus.

Welding Rod, Fluxed, Wire-Wrapped

Woven Welding Wire Co., 123-125 Hawthorne St., Rochelle Park, N. J. [Vol.75,p.324.] 62.

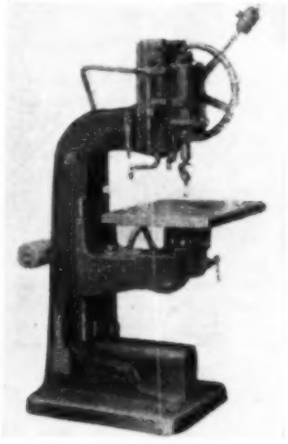
An electrode consisting of a base or solid core which has woven thereon a plurality of strands of fine wire, and with the intersticial pockets filled with an arc-sustaining or slag-producing flux, is being manufactured. It is possible to obtain practically any alloy combination by varying the weave.

Woodworking Equipment

Boring Machine, Wood, Vertical

Oliver Machinery Co., Grand Rapids, Mich. [Vol.75,p.719.]

A stationary head with a reciprocating spindle is the feature of the No. 272 single-spindle vertical wood borer,



in the center of 36 in. stock with one stroke. The table is adjustable 12 in. vertically, swivels in a complete circle and can be tilted 35 deg. in all directions. The table measures 20x24 in.

built for power, foot, or combination feed. Capacity is for boring holes up to 2 in., any depth up to 6 in., in the center of 33-in. diam. stock with the power feed, and the same diameter but up to 9 in. deep when using the foot feed.

The table is adjustable up and down and can be tilted to the right or left, forward or backward, and also moved horizontally toward or away from the operator.

Router and Borer, Pattern, No. 72-DR

Oliver Machinery Co., Grand Rapids, Mich. [Vol.75,p.537.]

For free hand routing and also boring in pattern shops, the No. 72-DR will bore holes up to 2 in., any depth up to 6 in.,

Sander, Pattern, Motorized

Oliver Machinery Co., Grand Rapids, Mich. [Vol.75,p.83.] 10.

This large-size, motor-shaft type of double-disk sander for pattern shops carries two 37-in. disks. Devices are provided for

duplicating work and for circular sanding. Hoods surround the disks for safety and for carrying the dust to the exhaust. The hoist is made a part of the machine.

Sander, Belt, Motor-Driven, No. 185-D

Oliver Machinery Co., Grand Rapids, Mich. [Vol.75,p.326.]

The machine is developed for sanding wood, sheet steel, aluminum, bronze, brass and composition, and will sand flat or slightly curved surfaces. It is made up of three separate

units, a table, the motor stand and the idler stand. The sanding belt is reversible. Ball bearings are used throughout. Belt length can be made as long as the user wishes it. The table is 32 in. wide by 96 in. long.

Parts and Mechanisms

Ball Bearings, Felt-Protected, Series 7000

Norma-Hoffmann Bearings Corp., Stamford, Conn. [Vol. 75,p.363.] 111.

This is a lubricant-packed, dirt-and-moisture-proof bearing.

Wide inner and outer rings give maximum contact on shaft and in housing, and the design is such that the bearing can be clamped on both sides. The "Greaseal" feature consists of a felt washer and a thin fiber ring interposed between split snap rings held in a groove in the outer ring. The inner ring is recessed to present a shoulder which, with the felt washer, forms a labyrinth.

Ball Bearing, Grease-Sealed

Federal Bearings Co., Inc., Poughkeepsie, N. Y. [Vol.75, p.430.] 128.

In this all-metal grease-sealed bearing the inner impeller and outer seal form a vacuum

pocket, preventing suction of foreign matter into the bearing. The impeller continually throws grease into the races and onto the balls, and the vacuum retains the grease. Standard S.A.E. dimensions are maintained.

Roller Bearing Units, Self-Aligning

Shafer Bearing Corporation, 6501 West Grand Ave., Chicago, Ill. [Vol.75,p.256.] 57.

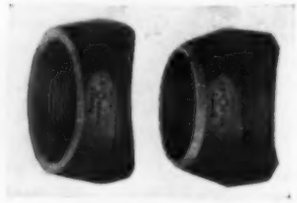
The company's double-row, self-aligning roller bearings, as used in standard-duty units, are now available in these light weight, compact, simple housings. The normal-duty units

are furnished as pillow blocks, flange units, and take-up units, in a full range of shaft sizes from ¾ to 3 in. The inner race of the bearing is extended on one end only and fastened to the shaft by a special locking collar. Sealing is accomplished by a grease seal. These stock units are self-aligning, without extra charge.

Fittings, "Weldolets" and "Thredolets"

Bonney Forge & Tool Works, Allentown, Pa. [Vol.75,p.325.]

These fittings are designed to be installed by simply welding them to a pipe line, using a fusion or V-weld, then removing the button and completing



the junction by welding or screwing the branch pipe to the Weldolet or Thredolet. The Weldolet is installed with both joints welded. Thredolets require only one weld, the outlet being tapped.

Fittings, for Welding, Steel, Seamless

Taylor Forge & Pipe Works, Chicago, Ill. [Vol.75,p.431.] 126.

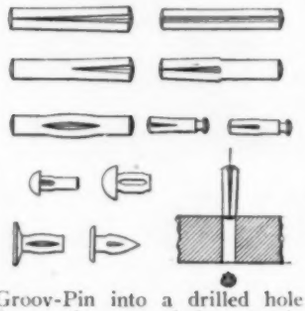
Seamless steel pipe fittings for welding consists of elbows, tees, nipples, and butt-welding flanges. All sizes up to 24 in. are manufactured. They permit

the entire pipe system to be fabricated by the use of circumferential welds, with fittings lighter than cast steel ones. The ends are beveled for welding.

Groov-Pins and Drive-Studs

Groov-Pin Corporation, 47-18 37th St., Long Island City, N. Y. [Vol.75,p.470.] 148.

The Groov-Pin is formed by pressing three longitudinal grooves into a straight pin, thereby upsetting the stock at its circumference. Driving a



Groov-Pin into a drilled hole forces the upset bulges partly back into the grooves, thus assuring a force-fit within the drilled hole.

Klip-Nuts and Spacers, "Wyeco"

Wyrick Engineering Co., Wyandotte, Mich. [Vol.75,p. 539.] 165.

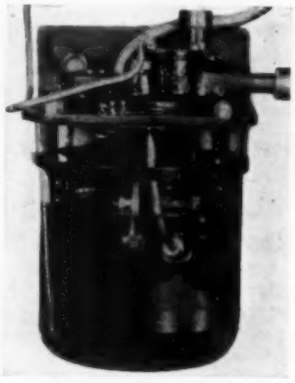
These products differ only in that the latter can be shimmed to different thicknesses. Either

device can be used directly as thrust or adjustment nuts, or they may be applied as spacing washers on milling machine arbors and in gear spacing. When they are used in lieu of a threaded nut, a groove in the shaft provides a seat for the device.

Pump, Lubricating Automatic

Bijur Lubricating Corp., 22-08 Forty-Third Ave., Long Island City, N. Y. [Vol.75,p.717.] 222.

This compact pumping unit for industrial lubricating systems consists of two main elements, a small gear pump and a timing mechanism to determine the amount of oil delivered



at definite intervals. These elements are mounted in a reservoir. The input shaft is operated by direct, belt, or chain drive from some rotating shaft on the machine. A cam governs the oil flow interval to the bearings. Maximum flow is 6 cu.in. per min.

Pumps, Variable-Delivery, Types QR-2 and QWR-2

Oilgear Co., Milwaukee, Wis. [Vol.75,p.287.] 77.

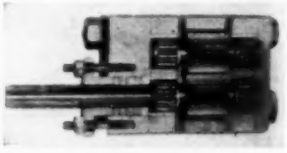
The Type QR-2 is a one-way, variable-delivery pump, having a capacity from 60 to 1,650 cu.in. per min. at a speed

of 860 r.p.m. Type QWR-2 is similar, but in addition has a constant and variable-pressure control from 500 to 1,500 lb. per sq.in. The former type is for use with cylinders where it is essential to have a smooth straight-line motion, the latter where it is necessary to hold the work under a predetermined pressure for a period of time. Both units can be used in combination with an Oilgear constant-displacement fluid motor as variable-speed transmission.

Pumps, Rotary, XD Series

Northern Pump Co., Minneapolis, Minn. [Vol.75,p.683.]

The larger XD series is of the same construction as the XA series, described on page 560, Vol. 74. Capacities range from 1 to 15 gal. per min. Nitralloy bearings are used in

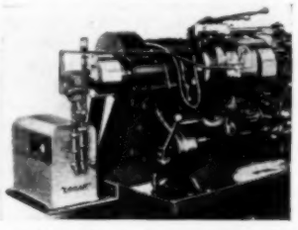


pumps to handle fuel oil, coolant and other liquid with little or no lubricating value. Roller bearings are incorporated for handling clean lubricating oil, especially for high pressures such as 1,000 lb. per sq.in.

Power Unit, Hydraulic

Logansport Machine Co., Logansport, Ind. [Vol.75,p.903.]

An hydraulic power unit suitable for operating chucks, workholding fixtures, clamps, hoists and the like is being offered. Pressure range is from 50 to 200 lb. per sq.in., and is ad-

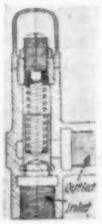


justable through a regulating valve. The unit consists of a motor-driven, constant-delivery, internal gear pump, a spring-loaded accumulator, a pressure regulator and a pressure switch. All units are inclosed in a compact case, exposing a panel board on which is mounted a motor switch, pressure gage, and oil level gage.

Valve, Oil-Relief Non-Chattering

Fulflo Specialties Co., Blanchester, Ohio. [Vol.75,p.38.] 11.

This valve is made in pipe sizes from ¾ to 1¼ in., and is suitable for pressures from 20 to 120 lb. per sq.in. Adjustment can be made by removing the cap and turning the screw

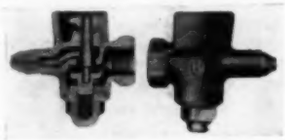


at the top. An important use of this valve is in connection with hydraulic pumping units where a specific pressure must be maintained.

Valve, Blow Gun

Ohio Brass Co., Mansfield, Ohio. [Vol.75,p.325.] 67.

Leakage, either through accidental opening or failure to shut tight, is avoided in this valve. A heavy flange protects the thumb button. The disk is of

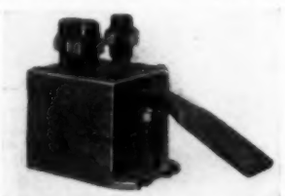


a special soft composition and fits against a machined seat, where it is held in positive contact by a spring as well as by the pressure of the air. The valve is regularly furnished with female threads in ¼- and ⅜-in. sizes.

Valve, Air, Foot-Control, Model GN

Logansport Machine Co., Logansport, Ind. [Vol.75,p. 363.] 96.

A small air piston mounted under the pedal automatically returns the pedal and reverses the valve when the operator's



foot is removed. The valve is regularly manufactured in ⅜-, ½-, ¾- and 1-in. pipe sizes.

Valve, Pressure-Relief

Brown & Sharpe Mfg. Co., Providence, R. I. [Vol.75,p. 682.] 215.

Developed for use with hydraulically operated machinery, this pressure relief valve will operate at pressures from 0 to 200 lb. per sq.in. Guides on the valve prevent fluttering and

noisy operation. Features are the large valve chamber and the double spring arrangement which gives wide range and flexibility. The valve is made to take 1-in. pipe.

Valve, Automatic-Control, Type I

Automatic Temperature Control Co., Inc., 34 East Logan St., Philadelphia, Pa. [Vol.75, p.793.] 292.

This Type I motor-operated controller is designed to handle

valves of either the rotary or slide-stem types. This controller is shown mounted with a single-seated Type GS globe valve as supplied for high - pressure gas using inspirator burners. In design, the screw shaft geared to the motor imparts straight-line motion to the operating yoke, which opens or closes the valve in two seconds.

Steels and Alloys

Steel, Carburizing, Special

Union Drawn Steel Co., Beaver Falls, Pa. [Vol.75,p. 578.] 193.

A special carburizing steel, which will not develop soft spots when casehardened, has been developed. The chemical specifications are as follows: Carbon, 0.10 to 0.20 per cent; manganese, 0.60 to 0.90 per cent; phosphorus, 0.04 per cent maximum; sulphur, 0.05 per cent maximum, and silicon from 0.20 to 0.30 per cent. The manganese and silicon contents are higher than in the SAE 1015 or SAE 1020 types, as it has been found that manganese and silicon in these proportions give a dense, homogeneous steel and one which responds readily to casehardening heat-treatments.

Steel, Corrosion and Heat-Resisting, "Cro-Tung"

Industrial Steels, Inc., Cambridge, Mass. [Vol.75,p.613.]

This steel has in a marked degree the physical properties of 18-8 chrome-nickel steel alloy, but exceeds the latter in remaining stable to 1,500 deg. F., with no brittleness range and having low creep. The analysis is as follows: Carbon, 0.15-0.25; manganese, 0.55 maximum; silicon, 0.55 maximum; chromium, 4.50 to 6.50; tungsten, 0.75-1.00; sulphur, 0.05 maximum, and phosphorus, 0.05 maximum. With proper heat-treatment the tensile strength is 125,000 lb. per sq.in.

Steel, Corrosion and Heat-Resisting, Bethadur

Bethlehem Steel Co., Bethlehem, Pa. [Vol.75,p.648.] 248.

Nine grades of Bethadur are manufactured. Bethadur No. 1 is of the standard corrosion-resisting iron type. The No. 4 is similar to No. 1 in that it requires no heat-treatment to bring out the maximum heat-resisting properties. No. 5 has more chromium than the No. 4. Bethadur No. 2 is the 18-8 composition. Bethadur No. 3 is primarily an acid-resisting steel. Nos. 6 to 9 have increasing amounts of carbon and also of chromium to increase the hardness and corrosion-resistance.

Steel, Die, Air-Hardening, "Ontario"

Ludlum Steel Co., Dunkirk, N. Y. [Vol.75,p.678.] 265.

A high-carbon, high-chromium die steel is being marketed under the trade name of "Ontario." It is resistant to abrasion, has high hardness and is non-deforming, but in addition has greater toughness and is easier to machine than the oil-hardening types. It is suitable for such applications as blanking, stamping and cold forming dies, particularly where distortion on warpage are to be avoided; thread rolling dies, either for hot or cold material; bending, forming, and seaming rolls; punches and shear blades, particularly for light gage material.

Steel, Low-Carbon, Machinery, "Economo"

Wheelock, Lovejoy & Co., Inc., Cambridge, Mass. [Vol. 75,p.613.] 211.

This 0.18 carbon molybdenum alloy steel has good machining qualities. The steel may be used as a general-purpose machinery steel in the natural condition or casehardened. Sizes carried in warehouse stock range from ½ to 8 in., and any size, shape or finish can be rolled or forged.

Steel, Screw, High-Sulphur, Special

Jones & Laughlin Steel Corp., Pittsburgh, Pa. [Vo.75,p.614.]

Developed for increased production in high-speed automatic machine work, this special high-sulphur bessemer screw steel should not be used for parts for which higher physical properties are required than are ordinarily found in SAE 1112 or regular bessemer screw steel. The increase in machine production over standard bessemer screw steel was found to range from 16 to 32 per cent with equal tool life.

Steel, Stainless, Free-Cutting

Republic Steel Corp., Massillon, Ohio. [Vol.75,p.394.] 115.

This free-cutting stainless is known as "Enduro-FC." A typical analysis is: carbon, 0.05 to 0.12 per cent; manganese, 0.25 to 50 per cent; silicon, 0.50 per cent maximum, and chromium, 12.5 to 15 per cent. Typical physical properties of the hot-rolled steel are: Yield point, 106,300 lb.; tensile strength, 137,900 lb.; per cent elongation in 2 in., 25; per cent reduction in area, 2, and Brinell hardness, 286.

Steel, Stainless-Veneered, "Plykrome"

Industrial Welded Alloys, Inc., 225 Broadway, New York, N. Y. [Vol.75,p.324.] 83.

"Plykrome" is a composite metal in which the stainless steel is veneered and completely weld-bonded to a mild steel slab. The metal can be bent, drawn, spun or flanged without cracking or parting the alloy from the steel. The ratio of alloy thickness to that of the sheet or plate can be anything desired, the plate having been made with 0.010 gage steel strip with an alloy ply of 0.00125 in. A ratio of 1:15 offers greatest economy.

Steel, Stainless-Veneered

Superior Steel Corp., Grant Bldg., Pittsburgh, Pa. [Vol.75, p.611.] 202.

This strip steel consists of a carbon-steel base to which is veneered a thin covering of 16 to 18 per cent chromium steel or 18-8 chrome-nickel steel. The veneer may be 10 to 20 per cent of the thickness of the composite metal, and may be had on one or both sides. The resultant product can be drawn or formed and the exposed surface is permanently bright after initial polishing.

Steel, Tool, Tough, Special

Carpenter Steel Co., Reading, Pa. [Vol.75,p.579.] 201.

Special tough carbon tool steel is being marketed after being subjected to a hot acid etch test and also a "timbre" test. The hot acid etch test reveals that there is no injurious pipe, slag, dirt, segregation, center cracks or other material defects. The timbre test shows whether the steel will crack in hardening, and assures the same pene-

tration of hardness, the same freedom from soft spots, and the same expansion or contraction in all lots. This special steel is not overheated when quenched from 1,550 deg. F., which prevents cracking in hardening or checking during grinding.

Steel Sheets, "Zurcosteel"

L. E. Zurbach Steel Co., Sixth & Bent Sts., Cambridge, Mass. [Vol.75,p.679.] 247.

Three grades of "Zurcosteel" sheets are offered. Zurcosteel A is equivalent to cold-rolled strip steel, having equal drawing properties and a similar surface. Zurcosteel B is carried in stock dry to take care of requirements where a flat sheet is required with very little drawing properties, but where the sheet is desired for painting or enameling. Zurcosteel C is hot-rolled continuous strip mill product, pickled, and of deep drawing quality.

Copper, Sheet, Electro-Deposited

Industrial Development Corp., 50 Congress St., Boston, Mass. [Vol.75,p.610.] 210.

Electro-deposited sheet copper in coils 60 in. wide by any length desired, and in gages down to 0.002 in., is available. There is no directional grain structure in the sheet, and therefore the tensile strength and elongation are uniform when tested either lengthwise or crosswise. One side is salmon pink; the other polished.

Tin Plate, Toncan

Republic Steel Corp., Youngstown, Ohio. [Vol.75,p.574.] 190.

The base material has the same analysis as Toncan copper molybdenum iron, and thus the plate may be used in many cases where ordinary tin plate would fail. Toncan Iron tin plate can be supplied in all base weights and sizes.

Silver Alloy for Brazing, "Sil-Fos"

Handy & Harman, 57 William St., New York, N. Y. [Vol.75,p.187.] 20.

"Sil-Fos," a low-cost, low-melting-point silver alloy for brazing, flows freely at 1,300 deg. F. It is applicable to work where higher-melting-point, base-metal brazing or welding alloys cannot be used without danger of weakening, distorting or destroying the parts adjacent to the joint. The alloy also requires less than the usual amount of flux. Lap joints in copper sheets show a tensile strength of approximately 30,000 lb. per sq.in.

Miscellaneous Equipment, Processes and Supplies

Blower, Floor-Level, "Aerospot"

American Propeller Co., South Bend, Ind. [Vol.75,p.539.] 169.

For directing a blast of air onto workmen required to work in hot places and also for cooling the work itself where required, the floor level "Aerospot" is made in two sizes with a ¾-hp. motor, using a 24-in. propeller, and with a ½-hp. motor with a 20-in. propeller, both running at 1,725 r.p.m.

"Aerospot" Blower

Blowtorch, Gas-Electric, "Electroblast"

Stark Tool Co., Waltham, Mass. [Vol.75,p.644.] 239.

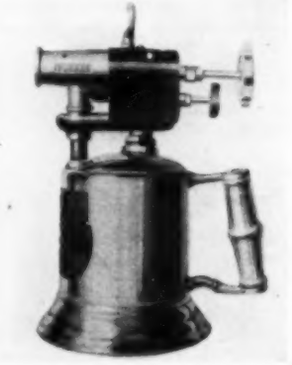
This "Electroblast" burns manufactured, natural or tank gas, the air blast being furnished by a built-in ⅛₀-hp. universal

motor. A temperature of 2,500 deg. F. is developed. The nozzle may be tilted to any required angle and produces a flame with a wide range of regulation. The Electroblast is also built with an aluminum case and pistol grip for hand use.

Blowtorch, No. 39-A

Turner Brass Works, Sycamore, Ill. [Vol.75,p.716.] 269.

On this No. 39-A blowtorch with a one-quart fuel tank, it is claimed to be impossible to jam

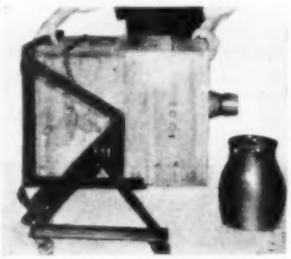


the orifice. A composition valve handle is a feature, and the drip cups can be filled through the lower valve.

Carboy Tilter

Schwenk Safety Device Corp., 27 Water St., New York, N. Y. [Vol.75,p.792.] 287.

This improved carboy tilter enables one man to safely truck, drain and otherwise handle acid carboys. The carboy is elevated into the tilter by levers. The

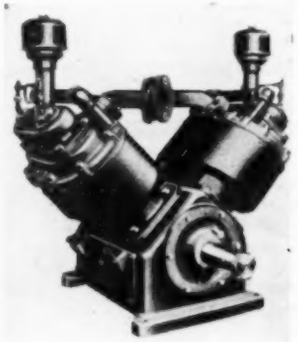


cradle wherein the carboy box rests provides support on three sides and the bottom, so that there is no danger of the bottle dropping through the box should the wood be in bad condition.

Compressors, Model C

Curtis Pneumatic Machinery Co., St. Louis, Mo. [Vol.75, p.936] 336.

The complete line consists of seven models, five of the two-cylinder type, ranging in size from 4¼x3¾ to 6½x5 in., with displacements of 25 to 125 cu.ft., and two of the four-cylinder type, a 5½x5¼ and a 6½x5¼ size, with displacements of 115 and

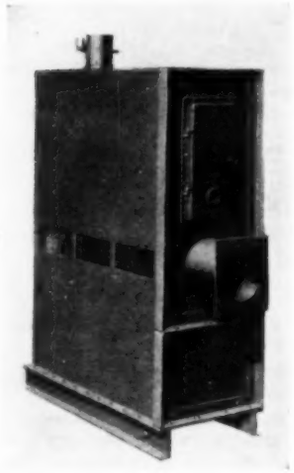


262 cu.ft., respectively. These compressors are furnished for drive from a lineshaft, by means of a separate motor or other prime mover, and also as self-contained units.

Heater, Gas-Fired, Indirect, Type L

Drying Systems, Inc., 1800 Foster Ave., Chicago, Ill. [Vol. 75,p.223.] 38.

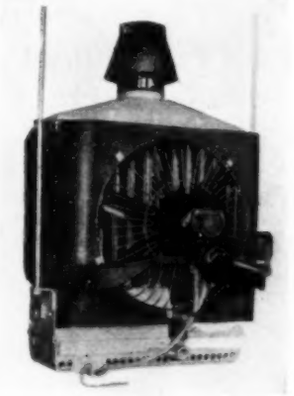
This heater can be used in practically any arrangement for fan blast work or space heating. The Type L heater is built in two standard sizes, three-tube or five-tube high.



Heaters, Gas-Fired

Surface Combustion Corp., Toledo, Ohio. [Vol.75,p.720.]

These unit heaters of the gas-fired type for heating industrial buildings may be used for either natural or artificial gas. The



heaters are made in three sizes, namely, with hourly B.t.u. inputs of 200,000; 120,000 and 60,000.

Jack, Journal, Aluminum

Duff-Norton Mfg. Co., Pittsburgh, Pa. [Vol.75,p.472.] 141.

Aluminum is extensively employed in this light-weight car inspector's journal jack. Two sizes of jack are available, one

having a capacity of 15 tons, the other 25 tons. Both models are equipped with a positive stop safety feature to prevent the lifting standards from becoming disengaged. The 25-ton jack weighs only 26 lb. and the smaller jack, 19 lb.

Lubricant Compressor Model PA-400

Alemite Corp., 2650 No. Crawford Ave., Chicago, Ill. [Vol.75,p.323.] 75.

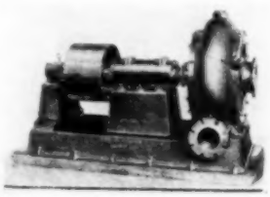
The system incorporates a lubrication compressor or reservoir of 410-lb. capacity, capable of delivering lubricants through-

out a shop. The system consists of a compressor or reservoir, a pump with the necessary valves and fittings, and the pipe lines. The reservoir is air-operated and requires from 40 to 100 lb. per sq.in. pressure.

Pumps, for Abrasive Materials, Type C

American Manganese Steel Co., Chicago Heights, Ill. [Vol. 75,p.327.] 84.

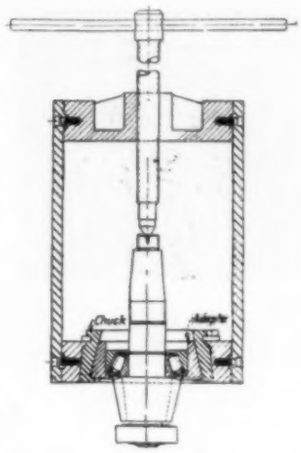
This pump is made of manganese steel. Bearings are interchangeable in the field, either sleeve or anti-friction types being available. Lubrication is required only on main bearings.



Press, Dismounting, Universal

Curtiss & Smith Mfg. Corp., 245-251 South St., Newark, N. J. [Vol.75,p.681.] 244.

For dismounting ball bearings, gears, bushings, collars, cams and pulleys from shafts, this universal dismounting press

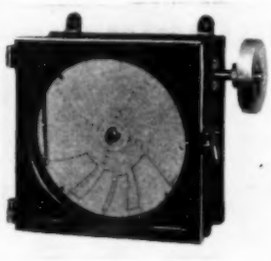


requires only the proper chucks and adapters. The press is made in several standard sizes and designs.

Recorder, Operation

Amthor Testing Instrument Co., Inc., 309 Johnson St., Brooklyn, N. Y. [Vol.75,p.505.]

The recorder shows the speed or rate of production at any time and every change in speed. It shows starting and stopping times, slowdowns, non-produc-

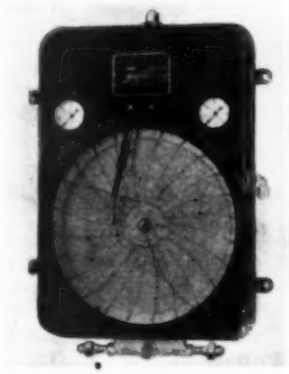


tive periods, the time and duration of each, and the actual production and idle time. The movement is based on the centrifugal principle. The recorder can be applied to practically any type of industrial plant machinery.

Recorder Controller, Air-Operated

Bristol Co., Waterbury, Conn. [Vol.75,p.538.] 179.

This air-operated recording controller features a "free vane" which is attached to and actuated by the measuring element of a temperature or pressure recording system. In passing into two air jets the free vane varies the amount of

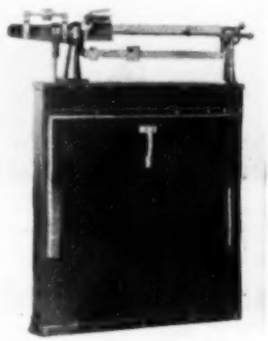


air which escapes, thus effecting control. Instruments can be had showing both pressure and temperature, with a pressure range up to 1,500 lb. per sq.in. and temperature range up to 1,000 deg. F.

Scale, "Convert-O-Matic"

Toledo Scale Co., Toledo, Ohio. [Vol.75,p.357.] 92.

This scale has a full-floating platform which stops losses caused by wear resulting from movement of the knife edge pivots on the bearings. It is possible at any time to add an

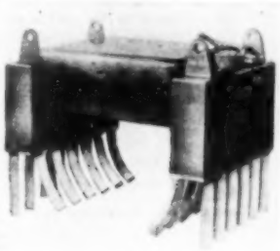


automatic indicating dial with full-floating double pendulum mechanism. Total weighing capacity may be increased one to four times by adding unit weights in the same cabinet. Thus, no equipment need be scrapped when the scale is modernized.

Spout, Magnetic, for Separating Chips

Dings Magnetic Separator Co., Milwaukee, Wis. [Vol.75, p.721.] 251.

A spout-type magnet is offered for separating chips from



cutting oils and other material handled in liquid form, consisting of an electro-magnet of high intensity suspended over a launder. Prongs dip into the cutting oil and the particles of iron are attracted by magnetism to the prongs.

Spray-Painting Outfit

DeVilbiss Co., Toledo, Ohio. [Vol.75,p.541.] 159.

This low-priced outfit, known as the NC-607, is particularly useful for small maintenance

painting. It operates from a light socket. The compressor and motor are securely mounted on a rubber-footed metal base.

Timer, Industrial

Warren Telechron Co., Ashland, Mass. [Vol.75,p.976]

A relay is so arranged that, if the motor is not running or is running under light load, the timer will not operate. Thus, only the actual working time of

the machine is recorded. The long hand indicates one-hundredths of an hour instead of minutes, and the short hand revolves once in ten hours instead of twelve.

Coating Process, "Leadhesion"

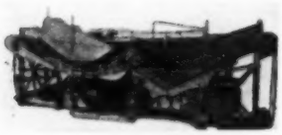
Gross Engineering Corp., 3955 West 25th St., Cleveland, Ohio. [Vol.75,p.649.] 238.

A permanently adhering lead coating of any desired thickness can be put on metal surfaces as a protection against corrosion by means of the "Leadhesion" process. This process can be used in the field as well as in regular shop work.

System for Cleaning Metals, Hot-Solvent, "S-M"

Rex Products & Manufacturing Co., Detroit, Mich. [Vol.75,p.863] 309.

A cleaning liquid known as "Perm-A-Clor," which is non-explosive and non-inflammable,



is used in this hot-solvent process for cleaning oils and greases from metals. It is used in the machine illustrated, work being placed on a conveyor and entering a compartment where it is drenched with a heavy vapor of the solvent. The foreign material is loosened and then swept away by powerful streams of boiling solvent. The work passes along the conveyor and is rinsed in a bath of distilled, hot solvent.

Casting Flux, Aluminum,

Apex Smelting Co., 2553 Fillmore St., Chicago, Ill. [Vol. 75,p.863.] 298.

The flux not only cleanses aluminum of foreign ingredients, but dispels gases and oxides contained in the metal and absorbed in the melting practice. It is smokeless, odorless, fumeless, and absorbs no moisture. Two to four ounces is required per 100 lb. of metal.

Cleaning Compounds

Cee-Bee Laboratories, Ltd., 655-657 E. Gage Ave., Los Angeles, Cal. [Vol.75,p.434.] 132.

These compounds are offered for use for all industrial cleaning problems. The compounds are physical agents and do not combine with oil, grease or any foreign matter. They clean by deflocculation of solids and the emulsification of liquids and may be applied by hand by immersion, by pressure gun or through circulation.

Lubricants, Gear, "Sturaco"

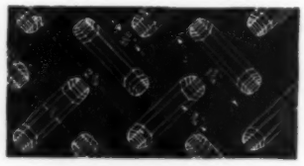
D. A. Stuart & Co., 2727-2753 South Troy St., Chicago, Ill. [Vol.75,p.578.] 204.

"Sturaco" products are available in either oil or grease forms to range in viscosity from S.U. 100 sec. at 100 deg. F., to 350 sec. at 210 deg. F., with a pour test for the lower viscosities as low as minus 40 deg. F. These lubricants are made in a sufficient range of properties to be suitable for high-speed spindle lubrication, bearing lubrication and for use in speed-reducing and other gears.

Floor Plate

Inland Steel Co., Chicago, Ill. [Vol.75,p.543.] 175.

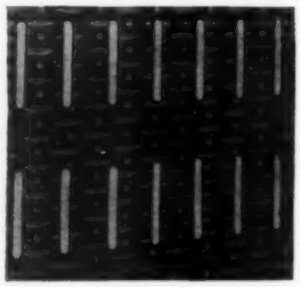
The non-skid pattern of this 4-way floor plate consists of short lineal projections arranged alternately at right angles, and permits less weight per square foot without loss of strength.



Floor Plate, Slotted

Central Iron & Steel Co., Harrisburg, Pa. [Vol.75,p.436.]

This grating is non-skid in all directions and because of its basic design, it requires no deep recess or rabbet in which to be set. It is furnished in almost any size up to 72x240 in.



Packing, Chevron

Garlock Packing Co., Palmyra, N. Y. [Vol.75,p.40.] 16.

For packing heavy-duty hydraulic equipment, the No. 430 Chevron packing is automatic in its action and packs tighter as the pressure increases. It permits a plurality of rings in shallow stuffing boxes. Ring sets only are furnished.

For high-temperature service, a No. 530 packing of similar design, but constructed of special heat-resisting materials, can be furnished.

Pulley-Facing Compound

Gripwell Mfg. Co., 110 West 34th St., New York, N. Y. [Vol.75,p.397.] 127.

Gripwell is a special compound used in connection with a treated canvas, producing a covering which when applied to cast-iron, steel or wood pulleys produces a semi-elastic gripping surface which reduces belt slippage. The compound contains preservative properties, which penetrate the pores of the belt and tend to keep it in a pliable condition.

Trichlorethylene

Roessler & Hasslacher Chemical Co., Inc., Empire State Bldg., 350 Fifth Ave., New York, N. Y. [Vol.75,p.579.] 198.

This liquid is heavy and colorless and boils at 188 deg. F., is not flammable or explosive, nor does its vapor form combustible or explosive mixtures with air. It is a solvent for oils, fats, greases, waxes, tars, gums, rubber and many resins. Trichlorethylene is particularly valuable in the metal-working industries for degreasing of metals.

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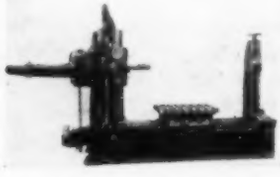
Boring and Turning Machines

Boring Machine, Horizontal, Small

H. W. Kearns & Co., Ltd., Broadheath, near Manchester, England. [Vol.75,p.75E.] 63.

This small horizontal boring machine is intended for work on aluminum and gunmetal. It is available in three sizes with spindles of 2½, 2¾ and 3 in., the corresponding spindle traverses



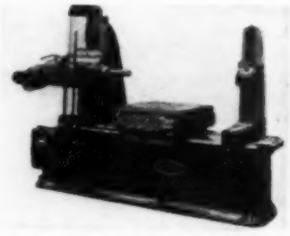
being 18, 24 and 30 in. The traveling spindle does not rotate independently of the sleeve, but slides through it. The spindle nose front end is arranged for mounting large milling cutters.

The spindle has 16 speeds. The worktable has a cross traverse and can be swiveled through a complete circle.

Boring Machine, Horizontal, Small

G. Richards & Co., Ltd., Broadheath, near Manchester, England. [Vol.75,p.156E.] 96.

This machine has a traversing spindle 2¾ in. in diameter, bored No. 4 Morse taper. Traverse is 20 in. and the diameter bored is 10 in. The 12

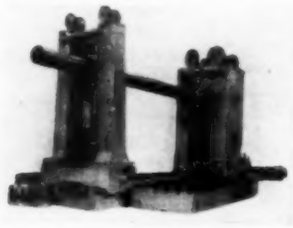


spindle speeds range from 17 to 400 r.p.m. The spindle has a vertical adjustment of 24 in. above the revolving table, and the maximum distance between the spindle nose and the boring stay is 60 in. Two tables are provided, namely a main table 37 by 26½ in. and a top detachable table, 30 in. sq., which swivels through a complete circle. The tables have a longitudinal movement of 30 in. and a traverse movement of 27 in.

Boring Machine, Horizontal, Turbine-Casing

G. & A. Harvey, Ltd., Govan, Glasgow, Scotland. [Vol.75,p.144E.] 93.

In this horizontal boring machine for turbine casings, the boring bar is carried at one end by a faceplate which is rotated, and at the other end is supported in the bearing of a stay in which it can both rotate and slide. The saddle carrying a 5-ft. faceplate is placed centrally between two standards mechanically coupled together, and it can be raised or lowered quickly or very slowly under complete control for a distance of 4 ft. 8 in. The faceplate column slides on a base below



either by quick or slow power traverse or automatic feeds.

The standards and stay have a horizontal traverse of 9 ft. The length of the worktable is 14 ft., and the total width is 18 ft., 1½ in. The minimum diameter of the bar in the stay is 15 in.

Boring Mill, 14-Ft.

G. Richards & Co., Ltd., Broadheath, near Manchester, England. [Vol.74,p.277E.] 15.

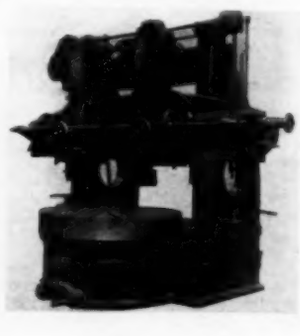
This machine is for work up to 170 in., admitting 108 in. under the cross-slide and 96 in. under the toolholders, the toolbars having a down feed of 48

in. Main drive is provided by a 50-hp. variable-speed motor and a 6-speed gearbox. The table is driven by single-helical gearing and has a special reversing motion for use when a short table-travel is required. Another feature is the adjustable swiveling slide on each standard saddle, for use when turning tapers up to 22½ deg., both above and below horizontal. Each head has a traverse of 18 in. along this slide.

Boring and Turning Mill, 6-Ft.

G. Richards & Co., Ltd., Broadheath, near Manchester, England. [Vol.75,p.181E.] 108.

This double-standard vertical boring and turning mill will admit work 6 ft. in diam., has a table 5 ft. 5 in. in diam., admits 3 ft. 5 in. under the toolholders, and 4 ft. 2 in. under the cross-slide. Arched construction of the cross-slide provides rigidity and the increased width below the point of fitting on the uprights prevents the tendency of the ram to tilt forward. A 12-



speed gearbox is arranged between the wings to give speeds from 1.19 to 24.24 r.p.m. The two heads are completely independent. Reversible feeds in 12 rates apply to the heads in the vertical, horizontal and angular directions. These range from 0.031 in. to 0.75 in.

Boring Machine, Cylinder-Block, Twelve-Spindle

Kitchen & Wade, Ltd., Halifax, England. [Vol.75,p.143E.]

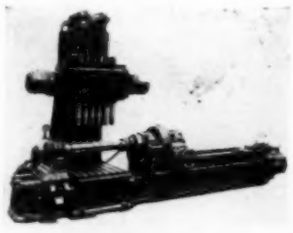
This duplex cylinder-block boring machine utilizes six spindles for roughing and six for finishing, or all 12 spindles can be used for roughing simultaneously. Each battery of spindles is entirely independent. The maximum center distance

of the outer pair of six spindles is 2 ft. 8 in., and the minimum centers of adjacent spindles 4⅜ in. The spindle heads are built on the unit pattern. The extension snouts are of hard steel. Each worktable has a working surface 4 ft. long by 12½ in. wide. Maximum distance from the spindles is 23¾ in. The machine will bore holes up to 5½ in. diam. by 12½ in. deep.

Boring Machine, Cylinder-Block, Six-Spindle

Craven Bros. (Manchester), Ltd., Reddish, near Stockport, England. [Vol.75,p.169E.] 99.

Six vertical spindles are used in this machine for boring



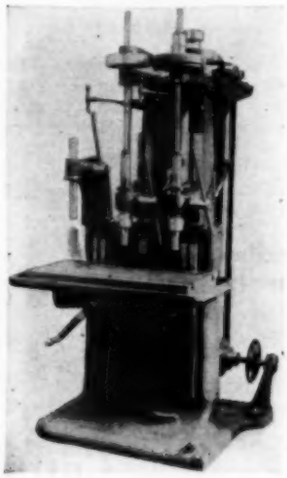
Diesel engine cylinder blocks and one horizontal spindle for boring the crankshaft bearings, all simultaneously. The vertical spindles are mounted on a slide having vertical hydraulic feed with a quick return motion. The traverse of the detachable drilling head is 18 in.

Drilling Machines

Drilling Machine, Sensitive, Two-Spindle

Jones & Shipman, Ltd., Leicester, England. [Vol.74,p. 277E.] 14.

This 15-in. sensitive drilling machine has three heads, two for drilling, the third a mandrel press. Machines of the same type are also supplied with automatic feed in three rates.

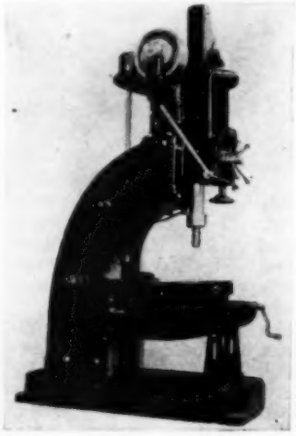


Holes up to 1¼ in. in diam. are drilled at the center of a 15-in. radius. The distance between spindles is 10 in. Six speeds are available, the range being from 240 to 1,920 r.p.m. The vertical spindle feed is 6 in.

Drilling and Boring Machine, Upright, 48-In.

G. Swift & Sons, Ltd., Halifax, England. [Vol.75,p.179E.]

This machine drills 3¼ in. in mild steel, and work 4 ft. 6 in. deep may be admitted between the spindle and the baseplate, and 2 ft. 10 in. between the spindle and the table. A power elevating motion is fitted to the balanced worktable, a swing-aside table provided with both longitudinal and transverse adjustments also being provided. The sixteen spindle speeds range from 20 to 600 r.p.m. The vertical traverse of the spindle is 20 in. The nine feeds vary from 30 to 155 cuts per in.



Drilling Machine, Inverted

H. Hipple, Munich, Germany. [Vol.75,p.32E.] 44.

For roughing-out dies in diesinking, this inverted drilling machine has an individual elec-

tric drive. The table can be swung aside horizontally. Above is a bracket similar to a tailstock. It carries a spindle movable vertically by lever, and a clamping piece below, which is controlled by a screw and serves to hold the work down on the drilling table. A suitable bushing is inserted in the table, and the drill is fed upwards by means of the capstan wheel. The table has a working diameter of 11⅞ in.; maximum distance between the table and the feeler is 8¼ in.; maximum drill taken, ⅜ in., and vertical adjustment, 6 in.

Drilling Machine, Radial, 4-Ft.

Kitchen & Wade, Ltd., Halifax, England. [Vol.74,p.254E.] 5.

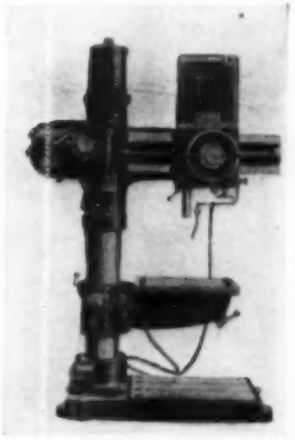
This 4-ft. electrically driven centralized-control radial drilling machine will drill cast iron up to 3 in. in diam. and mild steel up to 2½ in. The radial arm can be moved a distance of 2 ft. by power. The saddle traverses 2 ft. 10 in. along the arm on ball bearing rollers and has quick adjustment, fine hand feed, together with automatic trip motion to the feed. The spindle has a traverse of 12 in. and the nine speeds range from

800 to 40 r.p.m. and the six feeds from 36 to 150 cuts per in. The auxiliary spindle provides nine additional speeds up to 2,400 r.p.m.

Drilling Machine, Radial, 31½-In.

E. G. Herbert, Ltd., Levenshulme, Manchester, England. [Vol.74p,.317E.] 33.

This G.S.P. radial drills at a maximum radius of 31½ in.; minimum radius, 8½ in. Vertical traverse of the spindle is 12¾ in. The radial arm is fixed; the table swings around the column and has 19 in. vertical movement. Drive may be by

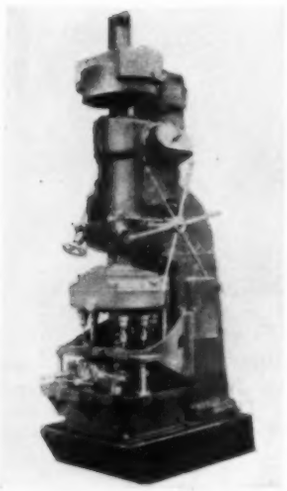


motor on top of the column, or fixed on a bracket on the baseplate, or by fast and loose pulleys with pedal control. Normally the speed range is from 59 to 1,250 r.p.m. Four feeds range from 0.0039 in. to 0.0197 in. per rev. Working surface of the table is 17¾ by 26½ in.

Drilling, Reaming and Facing Machine, Station-Type

Alfred Herbert, Ltd., Coventry, England. [Vol.74,p.266E.] 11.

For multiple operations on heavier work than that handled by the firm's automatic ballbearing drill, this machine is made in three sizes, namely, 16, 20 and 36 in. Eight spindle speeds are available by means of change gears. Each head is secured to a flange on the end of

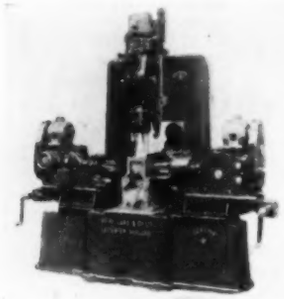


the counterbalanced spindle. The drill-head is bolted direct to the flange with the drive transmitted through a dog clutch.

Drilling Machine, Four-Way, Unit-Type

F. Pollard & Co., Ltd., Leicester, England. [Vol.75,p. 85E.] 68.

All holes in a motor-car change-speed gearbox are drilled simultaneously on this four-way, unit-type machine. Maximum distance between the spindle noses is 22½ in., and between the vertical spindle nose and the jib base, 26 in. The base and frame, as well as the jig and drill heads, are special, but the drilling elements consist of four standard auto-



matic units. The company makes five sizes of these units, the largest being capable of drilling 2 in. in steel.

Drilling Heads, Solebar

W. Asquith, Ltd., Halifax, England. [Vol.75,p.86E.] 69.

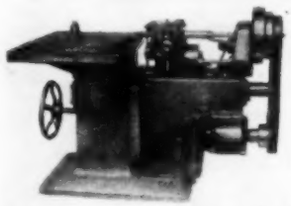
These three solebar drilling heads were furnished to a structural shop. In each the arm carries the driving motor and electrical equipment at the rear and the drilling head at the front. The solebar head is

mounted on a base which traverses along the bed, and the arm also has a movement of 2 ft. 4 in. across the base, both motions being on ball-bearing rollers and effected by hand. The 1½-in., No. 3 Morse taper spindle has four speeds ranging from 280 to 660 r.p.m. The vertical traverse is 13½ in.

Drilling Machine, Horizontal, Special

Adcock & Shipley, Leicester, England. [Vol.75,p.169E.] 100.

This machine is for drilling the body side beams of railway coaches. A feature is the quick approach of the drill before the actual feed starts. The drilling head is horizontally adjustable

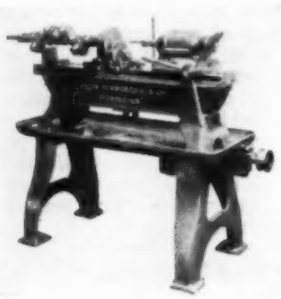


6 in. along a slide, with a rising and falling motion also of 6 in. obtained from a handwheel. An adjusting cam disk determines the amount of the quick approach before automatic feed.

Drilling Machine, Special, Crankshaft-End

John Ackworthie, Ltd., Coleshill St., Birmingham, England. [Vol.75,p.7E.] 36.

This machine is for drilling and tapping the 4 to 6 holes usually required in the ends of crankshafts for automotive engines. A hardened disk is

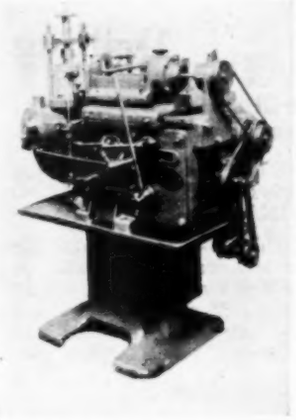


fitted over the end of the shaft and is provided with slots on one face equal to the number of holes to be drilled. A flynut moves an index finger into one of the slots in the disk previous to drilling. After the hole has been drilled the shaft is moved around to the next position.

Drilling Machine, Oil-Hole

Adcock & Shipley, Leicester, England. [Vol.75,p.121E.] 86.

This oil-hole drilling machine has a production of 60 to 70

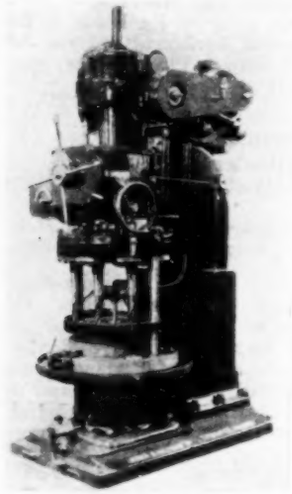


aluminum pistons per hour. The work is placed on an indexing table at one end and location is given by a cone which enters the wristpin hole. A swing-aside clamping plate is used, and final clamping is by a spring-loaded friction pad.

Drilling Machine, Pipe Flange

Jones & Shipman, Ltd., Leicester, England. [Vol.75,p. 132E.] 87.

Eight 1¾-in. holes are drilled simultaneously in pipe flanges by this machine. The holes may be on any pitch circle from 14 in. minimum to 20¾ in. maximum. The table has two locat-



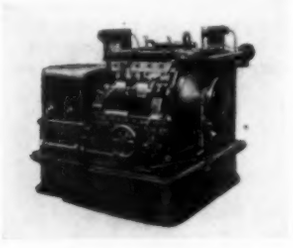
ing positions, so that 16 holes may be drilled in each flange by means of an 8-spindle attachment. A gearbox with sliding gears gives four rates of positive automatic feed. An adjustable positive stop disengages the automatic feed at the predetermined depth.

Gear Cutting Machines

Gear-Generating Machine, Double-Helical, Rapidan

Power Plant Co., Ltd., West Drayton, England. [Vol.74,p. 294E.] 23.

This gear generator works on the same principle as the Sykes machine, and is intended for high-speed production of double-helical gears up to 10 in. diam. by 4 in. face with helical angles of 30 or 40 deg. In the double-helical form continuous teeth may be produced with sharp apexes, the position of the apex being adjusted by



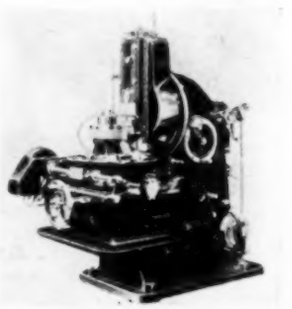
an eccentric; or staggered double-helical gears can be produced. If a central groove is turned in the face of the gear the two sides may have different numbers of teeth and both sides are produced simultaneously.

The automatic feed is obtained hydraulically and is continuous. Drive may be had by motor or single-pulley, driving direct to a four-speed gearbox.

Gear-Cutting Machine, Spur and Spiral, Maag

Sulzer Bros., Bedford Square, London, W.C., England. [Vol. 75, p. 39E.] 47.

This Maag high-speed gear-cutting machine cuts spur blanks up to 17¾ in. diam. by 4½ in. wide, and helical gears from 11¾ in. diam. by 4 in. face at 15 deg. helix angle to 6¾ in. diam. by 2¾ in. face at 60 deg. helix angle. The maximum pitch in each case is 6 module. The machine uses a rack-type cutter for generating, and a feature is a gage which not only serves to set the cutter parallel to the motion of the worktable, but also enables the correct tooth depth to be set to scale without reference to the outside diameter of the gear blank. An automatic device stops the machine when the gear is completed. The number of strokes can be altered in nine steps.

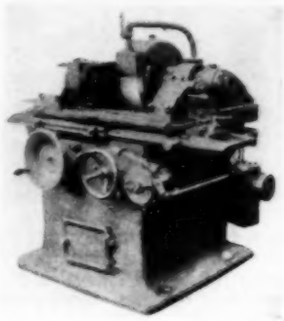


Grinding Machines

Grinder, Form

Jones & Shipman, Ltd., Leicester, England. [Vol.74,p. 254E.] 4.

This wide-wheel plunge-cut or form grinder uses a wheel 16 in. in diam. by 5-in. face by 8-in. bore, running at 1,200 r.p.m. The swing over the table is 12 in. in diam. by 15

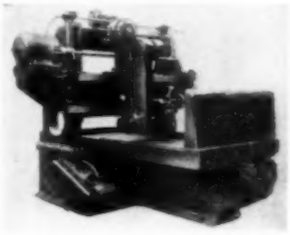


in. between centers. Table traverse is by a rack or screw for 11 in., the cross-traverse being 6 in. This may be either by hand or automatic, cam-operated. The hand feed can be adjusted to 0.00025 in.

Grinder, Surface

Churchill Machine Tool Co., Ltd., Broadheath, near Manchester, England. [Vol.75,p. 7E.] 37.

In this machine separate motors are used for the drives of the various movements, with integral push-button control panel for all motors. The table surface is 6 ft. by 2 ft. 3 in. and the maximum distance under the wheel is 2 ft. 3 in. The

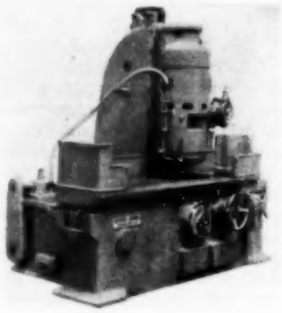


traversing table is operated by hydraulic mechanism, and at each end of the traverse stroke the wheelhead can be set to move automatically in a transverse direction, thus covering the entire surface of the table. Cross movement per traverse stroke is variable and can also be actuated by hand.

Grinder, Surface, Hydraulic, Naxos-Union

Selson Engineering Co., Ltd., Hatton Garden, London, E.C., England. [Vol.75,p.119.E] 83.

Two sizes of this grinder are available for grinding dies, tools, packing blocks and

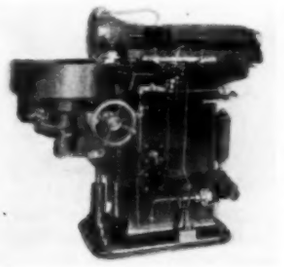


wedges. One size grinds up to 29½ in. long and the other, 39½ in. Maximum width ground is 10¼ in. and the maximum height of work admitted is 11 in. The worktable is reciprocated by oil pressure, and the feed can be changed at will. Table speeds vary from 7⅞ to 394 in. per min. The wheel spindle forms the arbor of the driving motor, and the feed may be by hand, or automatically at from 0.0001 in. to 0.002 in. per stroke.

Grinder, Surface, Hydraulic

Selson Engineering Co., Ltd., Hatton Garden, London, E.C., England. [Vol.75,p.41E.]

This hydraulic surface grinder will take work up to 17⅛ in. diam. by 11⅛ in. deep. Horizontal movement of the grinding wheelhead over the work is by hydraulic means. The length of stroke can be varied from ⅛ to 9⅞ in. The reverse is controlled by two blocks, with micrometer adjustment,

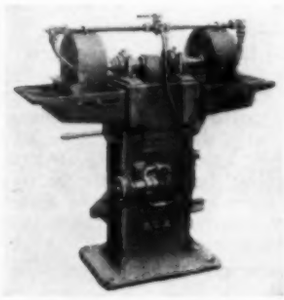


the accuracy of reverse enabling shoulders to be ground to close limits. The work table has an adjustment of 5 deg. for conical grinding. The vertical feed is operated by hand or automatically.

Grinder, Tool for Tungsten Carbide

W. Forrest & Co., Sylvester Gardens, Sheffield, England. [Vol.74,p.286E.] 19.

This double-ended tool-grinder is designed for tungsten-carbide-tipped tools. Cup wheels are used and the guards are



adjustable. The wheel spindle runs at 2,700 r.p.m. Wheels are 9 in. diam. by 3½ in. by 1-in. hole. The tool rests are adjustable for the angle.

Grinder, Tool, Duplex

S. Wolf & Co., Ltd., 115 Southwark St., London, S.E., England. [Vol.74,p.316E.] 32.

This Simon duplex tool grinder is driven by a 5-hp. motor built in at the top, with the grinding wheels mounted on the armature spindle. The

motor is controlled by push-button switches at the front. On d.c. machines the toolrests are automatically connected with the switch gear to accommodate wheel wear.

Grinder, Tool

Ornamental Turning Co., 77 Regents Park Road, Chalk Farm, London, N.W., England. [Vol.75,p.53E.] 55.

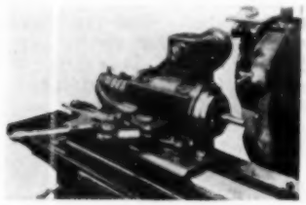
This grinder, developed for the slide-rest tools, drills, and cutters developed by the company, consists of a tool receptacle and slide advanced and

withdrawn by the depth-screw, and a cradle that rotates on a pivot screw just under the wheel. Any angle for the face or faces of the tool being ground is obtained by the setting of the little black steel index on the quadrant. This arrangement is for tools with straight edges.

Grinder, Chamfer

Churchill Machine Tool Co., Ltd., Broadheath, near Manchester, England. [Vol.75,p. 170E.] 102.

This machine is for grinding the small chamfer at one end of automobile splineshafts. The

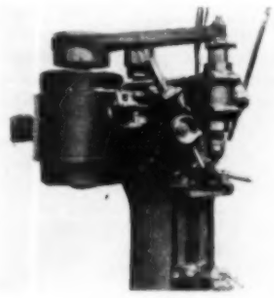


workhead has a lever-operating mechanism which operates the collet chuck and swivels the head. For imparting the chamfer the workhead in the operating position is set over at an angle to the axis of the grinding wheel. On completion of the operation the head is swiveled so as to permit removal of the work, the collet being released simultaneously.

Grinder, Internal, Vertical

Churchill Machine Tool Co., Ltd., Broadheath, near Manchester, England. [Vol.75,p. 155E.] 95.

Center holes, either hardened or otherwise, can be corrected by grinding with a formed abrasive pencil on this machine. In setting up, a center is inserted in the chuck and registered in the upper center hole



of the work, the foot-stock center locating the work similarly at the lower end. After the two centers are thus located, the shoes of the work-steady are adjusted and the spindle center removed in favor of a grinding pencil. The maximum length of shaft accommodated is 48 in., the maximum diameter being 9 in.

Grinder, Roll

John Holroyd & Co., Ltd., Milnrow, near Rochdale, England. [Vol.75,p.31E.] 43.

For grinding rubber rollers up to 6 in. in diam. by 9 ft. between centers, the 8-in. machine illustrated has been developed. The bearing ends of the roller shafts are supported in adjust-

able steady-rests. A wheel mounted on a saddle performs the grinding. The fast headstock gives four speeds from 54 to 193 r.p.m. It is driven by means of Texropes from a 2-hp. motor. The machine occupies a floor space of 14 ft. by 3 ft. and weighs 3,600 lb.

Grinder, Snap-Gage

Selson Engineering Co., Ltd., Hatton Garden, London, E.C., England. [Vol.74,p.316E.]

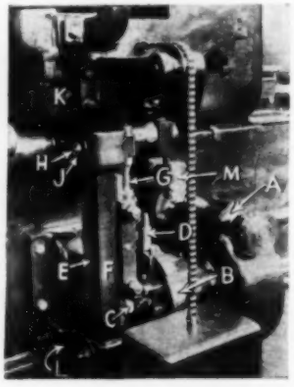
This Max Hasse snap-gage grinder and polisher finishes the work at one setting, the right-hand headstock being for polishing and the left-hand for grinding. Each spindle has a compensating device which prevents

any displacement of the wheel or disk through expansion by heat or end play. Both headstocks have independent cross adjustment. The work-holding arrangements consist of a main table with automatic feed to and from the wheel for grinding. On the main table is mounted an auxiliary fine-adjustment table which carries the clamping device for the gage. The largest gage ground is $3\frac{13}{16}$ in. and the maximum automatic grinding stroke is $1\frac{31}{32}$ in.

Cambering Mechanism for Plain Grinders

Churchill Machine Tool Co., Ltd., Broadheath, Manchester, England. [Vol.74,p.256E.] 7.

This special cambering mechanism is for the larger sizes of plain grinding machines. No camber bar is used, the motion for operating the mechanism being derived from the bull-wheel shaft of the traverse mechanism. In the worm drive at *A* the wormwheel is connected to the crank disk *B*, to which only a partial rotary motion is transmitted even on full traverse strokes. The throw of the crankpin *C* is varied by the adjusting screw *D*. In any position other than dead center it causes the bar *E* to rise and fall because the crankpin is in contact with the slide *F*, which is connected through the screw *G* to the pin *H*, which passes through the end of the lever *J*. The latter has its fulcrum against the side of the bed and a short arm behind the adjusting screw *G* which connects by means of a thrust pin to the

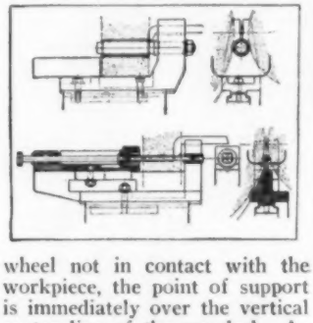


rear end of the wheelhead slide *K*. The front of the latter is mounted on a knife-edge, about which the whole of the wheelhead is rocked by the cambering mechanism.

Grinding Attachments for Centerless Grinders, Concentric

B.S.A. Tools, Ltd., Sparkbrook, Birmingham, England. [Vol.75,p.54E.] 56.

Attachments for the No. 12 centerless grinders are available by which the exteriors of hollow cylinders may be ground concentrically with the bore by the centerless grinding method. Two attachments are available, one for grinding relatively small bushings and the other for larger bushings. With the grinding wheel or the control

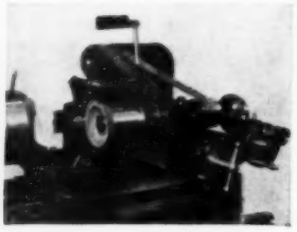


wheel not in contact with the workpiece, the point of support is immediately over the vertical center line of the mandrel. As soon as the grinding wheel is brought into contact with the workpiece, this is pushed into contact with the control wheel and the point of support changes to a point somewhere between the vertical and horizontal lines and towards the grinding wheel. Since the center of the mandrel is below the center line joining the two wheels, trouble arising from work which is out of center is prevented.

Grinding Spindles, Twin, "Intermatic"

Churchill Machine Tool Co., Ltd., Broadheath, near Manchester, England. [Vol.74,p.304E.] 26.

To carry out the grinding of bores and adjacent faces at the same setting on the Intermatic internal grinder, the machine is now supplied with two grinding spindles. The heavier spindle is suitable for carrying a small cup wheel, and is placed outside the internal spindle. The two spindles are mounted in a bracket attached to the cross-slide, the internal spindle being

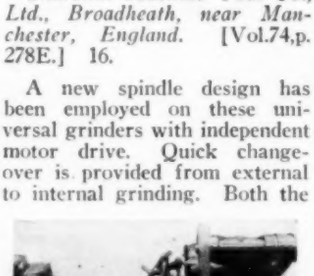


fixed relatively to the cross-slide, whereas the spindle for the face-grinding wheel is mounted in a separate slide so that the face of the wheel can be adjusted in relation to the edge of the internal grinding wheel.

Internal Spindle Mounting

Churchill Machine Tool Co., Ltd., Broadheath, near Manchester, England. [Vol.74,p.278E.] 16.

A new spindle design has been employed on these universal grinders with independent motor drive. Quick change-over is provided from external to internal grinding. Both the

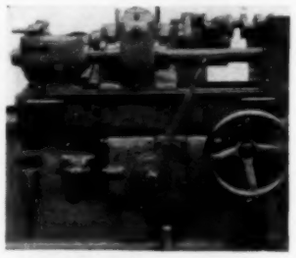


bracket carrying the internal spindle and the speed bracket are mounted on a common pivot center so that the former can be raised clear of the operating position and clamped while external grinding is in progress.

Spacing Device for Crankshaft Grinders

Churchill Machine Tool Co., Ltd., Broadheath, near Manchester, England. [Vol.74,p.286E.] 21.

This improved spacing device for use on production crankshaft pin and journal grinders has a spacing bar which is new. The rectangular plate or bar in which



the notches are cut to locate the table for spacing from pin to pin or journal to journal is now double-sided, thus being suitable for two different shafts. The plate has pivot centers at each end.

Wheel Dresser, Peristat

Wearden & Guylee, Ltd., Bradford, England. [Vol.74, p.306E.] 28.

This Peristat wheel dresser for precision grinders is made in two sizes, one suitable for all plain cylindrical grinders and the other for smaller machines and for use on grinders with low poppet centers. Two bronze cheeks carry ball bearings, and the conical spindle carries the cutter which runs in the bearings. The cutter

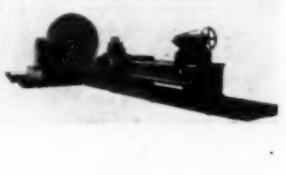
itself is a steel disk which has in its face a series of undulations machined from the solid.

Lathes

Lathe, Gap, 21-In.

Henry Broadbent, Ltd., Sowerby Bridge, England. [Vol. 75,p.108E.] 79.

This 21-in. center, all-geared gap lathe will admit work 18 ft. 6 in. long between centers when the gap is closed and 24 ft. 6 in. long when the gap is open. It swings 8 ft. in diam. by 6 ft. wide in the gap over the baseplate and 12 ft. diam. by 4 ft. wide in the pit. The sliding bed is of box section. The 18 spindle speeds range from 1 to 100 r.p.m. The faceplate is



7 ft. in diam. Drive is from a 20-hp. constant-speed motor. The feedbox gives 8, 16 and 32 cuts per in., and corresponding threads.

Lathe, Surfacing, 36-In.

Dean, Smith & Grace, Ltd., Keighley, England. [Vol.74,p. 265E.] 9.

A feature of this surfacing and boring lathe is the quick power traverse motion to the saddle apron. This power traverse is obtained from a constantly revolving shaft below the

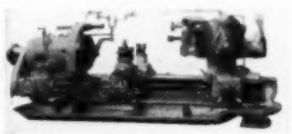
feed shaft and driven by chain drive from a shaft within the bed. A spring-loaded multiplate clutch slips if the saddle runs into some rigid object.

The 16 spindle speeds range frm 240 to 2.5 r.p.m. A 4⅝-in. hole is drilled through the spindle which runs in phosphor-bronze bearings and has the end thrust taken by a ball thrust bearing.

Lathe, Turret, Combination, No. 21

Alfred Herbert, Ltd., Coventry, England. [Vol.75,p.107E.] 78.

The overhead tool support mounted on the headstock clears the full swing over the bed. The height of centers is



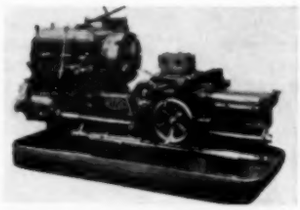
16 in., the swing over the cross-slide 24 in., and the hole in the spindle 7¼ in. Maximum distance from the flange of the spindle to the face of the turret is 96½ in.

The 16 spindle speeds range from 5 to 201 r.p.m., the nine feeds to the chasing saddle from 11 to 104 cuts per in., transverse feeds from 16 to 154 cuts per in., and the turret slide feeds in 18 steps from 9.5 to 250 cuts per in. The back tool-post carries form or cutting-off tools.

Lathe, Turret, 9-In.

Craven Bros. (Manchester), Ltd., Reddish, near Stockport, England. [Vol.75,p.178E.] 104.

In this 9-in. center chucking lathe the maximum length admitted between the chuck and the turret face is 3 ft. 4 in. The all-geared head gives 24 spindle speeds, from 6 to 314 r.p.m., the final low-speed drive being di-



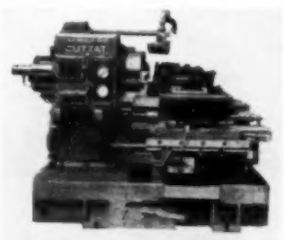
rect to the chuck. The spindle is bored 2⅞ in., and is counterbored for a pilot bushing and has the flange solid. The motor is controlled by two push buttons. Besides hand motion along the bed, the saddle has reversible self-acting sliding and surfacing feeds, the four rates provided being 24 to 96 cuts per in. for sliding and 48 to 192 cuts per in. for surfacing.

Lathe, Multi-Tool, Hydraulic, Automatic

Dowding & Dickinson, Greycoat St., Westminster, S. W., England. [Vol.75,p.38E.] 46.

This Cuttat Oleomatic is entirely automatic and swings 8 in. over the slides. Hydraulic operation is furnished to the front and rear tool slides, to the chuck and to a disk clutch for stopping and starting. While the machine is suitable for heavy roughing work, solid positive stops insure precision on finishing.

The spindle is carried in Timken roller bearings. The front saddle carries an upper tool-slide, which may move longitudinally, crosswise or at an angle, and by the double hy-

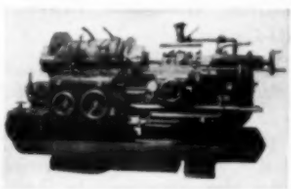


draulic feed movement the motions can be made successively or simultaneously. For work requiring two different angles a former may be fitted to the upper slide. The rear saddle slide may be swiveled.

Lathe, Multi-Tool

Benrath Machine Tools, John Dalton St., Manchester, England. [Vol.74,p.240E.]

This multi-tool lathe will turn 7⅞ in. in diameter by 25½ in. long, and has hydraulic speeds to the top slide on the car-

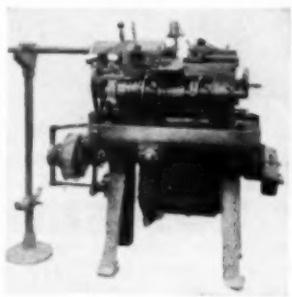


riage. The hydraulic attachment enables a perfectly uniform cycle of movement in cutting tools. The feed movement is limited by positive stops. In conjunction with the handwheel and the micrometer dial on the spindle of the top slide, the tools may be set to precise diameter.

Screw Machine, Automatic, 5/16-In.

B.S.A. Tools, Ltd., Sparkbrook, Birmingham, England. [Vol.74,p.242E.] 3.

Standard and special ⅝-in. high-speed screw machines have a time cycle varying from 3 to 91 sec., but in the special machine idle time for stock feeding and turret indexing has been reduced. Turret travel is also

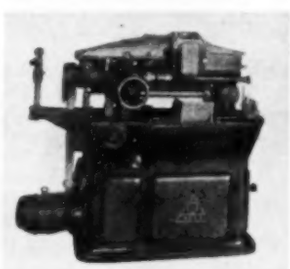


restricted, length turned being ¾ in. instead of 1¼ in. In both machines the maximum distance between turret and chuck is 3 in., minimum distance in the special machine is 2⅞ in. and in the standard machine 1⅜ in. The turret is 3⅜ in. in diam., the six holes being ⅜ in. in diam. The machine may have two forward speeds or one forward and one reverse speed, the total number of spindle speeds being 14, ranging from 5,120 to 328 r.p.m.

Screw Machine, Automatic

Leo C. Steinle, Ltd., Marsham St., Westminster, S.W., England. [Vol.75,p.119E.] 82.

This Index O.R. machine is made by Hahn & Kolb, Esslingen-Neckar, Germany. A

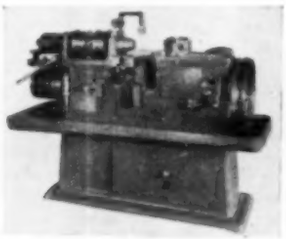


wide range of work is obtainable by the use of a 6-sided turret, high-spindle speeds, threading by overtaking, and a quick succession of operations made possible by swinging side tools. The chuck capacity is for ⅛ in. diam. rounds, the maximum bar feed is 1⅛ in. per indexing. Soft steel ⅛ in. diam. or brass ⅜ in. diam. can be threaded. The eight speeds available range from 925 to 5,000 r.p.m. The time for producing one piece is from 1 to 68 sec.

Automatic, Improved, ¾-In.

A. Butterworth & Co., Rochdale, England. [Vol.74,p.276E.]

The machine illustrated has a special feed tube to take stock up to ⅞ in. in diam. The turning length is 4½ in. and the turret has six 1-in. tool holes and an adjustment along the bed of 2½ in. The height from the cross-slide to the center of the spindle is 2¼ in. Ten spindle speeds are available. The base

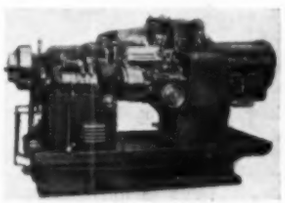


now provides a large coolant tank, and an aluminum guard is placed over the feed bracket to protect it from cutting oil.

Automatic for Bar Work, Four-Spindle

Benrath Machine Tools, John Dalton St., Manchester, England. [Vol.75,p.66E.] 66.

This automatic is made by Carl Hasse & Wreder G.m.b.H., Berlin, for use with Widia tools, at spindle speeds up to 1,250



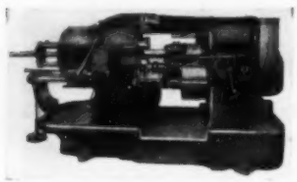
r.p.m. For setting-up purposes no cams have to be changed, but simply the cutting tools with standard toolholders and also dogs are set on a single controlling drum. Eight tooling positions and three special positions permit relatively complicated parts to be finished rapidly.

Automatic, Four-Spindle, 1¾-In.

B.S.A. Tools, Ltd., Sparkbrook, Birmingham, England. [Vol.75,p.171E.] 103.

This automatic is available as a 1¾-in. bar machine and a 4-in. chucking machine. The top facing slides both simplify tooling and add to the usefulness of the

machine. In the bar machine the longest main tool slide feed is 8 in., the maximum length of regular turning is 7 in., and the



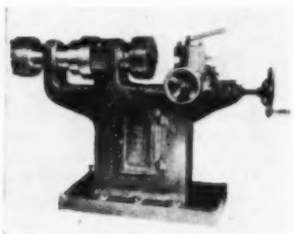
14 spindle speeds range from 187 to 770 r.p.m., and the 40 tool slide feeds from 0.001 in. to 0.05 in. per rev.

The chucking machine has a maximum swing of 7 in., and the largest turning capacity is 4 in. diam., the maximum length of regular turning and the longest main tool slide feed being 6 in. The 14 spindle speeds range from 107 to 440 r.p.m., and the feeds are the same as for the bar machine.

Second-Operation Machine, 7-In.

Summerskill Bros., Sowerby Bridge, England. [Vol.74,p.286E.] 20.

This 7-in. centering and general-purpose machine can be used for a large variety of light work such as square-centering, shortening, easing or polishing studs and for facing collars, boring small bushings and other parts. A hollow steel spindle carries a 3-speed driving cone

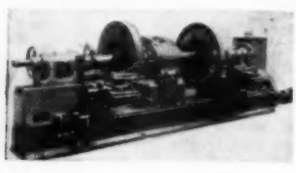


and 4-jaw and 3-jaw universal chucks of 8 in. diam. These chucks are interchangeable so that square material may be dealt with. The hole through the spindle is 2½ in. diam., suitable for bar work. The turret and saddle have a 12-in. traverse and the turret will take any standard type of tool.

Lathe, Axle-Journal

J. Holroyd & Co., Ltd., Milnrow, Rochdale, England. [Vol. 74,p.265E.] 8.

With main drive by constant-speed motor, the axle is driven from a central headstock through a split hollow spindle. Gears



provide three work speeds, and the loose heads have the necessary adjustment along the slide. The tools for roughing, finishing, radiusing and burnishing are held in square turrets located by cross slots on the slides. Each turret slide can be adjusted longitudinally by hand or automatically by ratchet motion.

Lathe, Axle-Journal

Craven Bros. (Manchester), Ltd., Reddish, Stockport, England. [Vol.74,p.285E.] 18.

This machine is for returning simultaneously the inside journals of locomotive straight or cranked axles with wheels mounted, and facing the insides

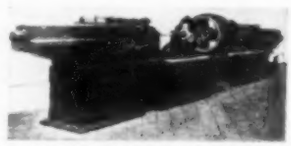
of the wheel hubs. Wheels up to 7 ft. diam. on the tread are admitted with the axles mounted on a 4 ft. 8½ in. gage, and with the outside crankpins up to a maximum length of 7 ft. 7¼ in. over the pins. Faceplate speeds range from 4 to 24 r.p.m.

A saddle and rests are provided for returning inside journals. The feeds are $\frac{3}{32}$, $\frac{1}{16}$, and $\frac{1}{8}$ in. per rev. of the faceplate.

Lathe, Automotive-Axle

Oldfield & Schofield Co., Ltd., Boothtown, Halifax, England. [Vol.75,p.134E.] 90.

Axles up to 8 ft. long are accommodated in this machine, each head boring holes up to 3 in. diam. by 3 ft. 6 in. long. The bed consists of two heavy box-section castings, each carrying a boring head, and a third central casting, on which is mounted the driving member. The boring heads support



square-section steel rams having a traverse of 4 ft. The spindle in the center driving head has a 24-in. hole through and carries inside a driver for long axles, or a pair of circular grips for two short axles. The speed range is from 15 to 150 r.p.m.

Lathe, Boring and Turning, Pipe, 18-In.

G. Swift & Sons, Ltd., Halifax, England. [Vol.75,p.52E.]

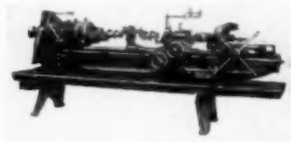
This 18-in. center double-headed lathe is for boring cast-iron pipes at the socket end and for turning the same pipes at the spigot end. Pipes may range from 6 to 24 in. diam., and from 9 to 12 ft. long. They are lifted into the quick-clamping chain vises at each end of

the bed. Two driving headstocks are used, one on each end of the bed. Each carries a 3-ft. faceplate, each faceplate bearing four steel cutterblocks. Each cutterblock is fitted with two cutters for roughing and finishing.

Lathe for Crankshafts, Capstan-Type

Alfred Herbert, Ltd., Coventry, England. [Vol.74,p.293E.]

This capstan lathe is intended for turning the flanged or flywheel ends of automobile crankshafts, and the saddle and the turret slide can be moved nearer to the headstock so that ordinary capstan-lathe work can be done. In each case the height of centers is 6½ in., but the bed may be had in two different lengths so that in one the maximum distance from the end of the spindle to the face of the capstan is 52¼ in., and in the other, 76¼ in. Each type is



made either with a chasing saddle or with traversing saddle. In all machines the largest bar admitted is 2 in., and the stroke of the capstan, 9 in. Feeds range from 40 to 160 cuts per in., and the speeds from 30 to 511 r.p.m.

Milling Machines

Milling Machine, Plain and Universal, No. 2J

J. Parkinson & Son, Shipley, England. [Vol.74,p.241E.]

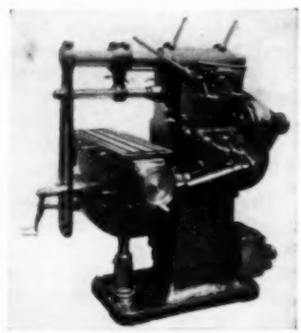
The plain machine has a table working surface of 51x12¼ in.; and the universal machine, 40x11 in. Table movements of the plain machine are 30x10x18½ in., and of the universal machine 28x10x18½ in. The drive

may be either from the line-shaft or by an inclosed motor. The 12 spindle speeds range from 17 to 450 r.p.m., and the spindle runs in Timken roller bearings. Both machines have power feed and power traverse in all directions of table movement. Power feed to the longitudinal, vertical and cross movements is in 12 rates, from ½ to 10.4 in. per min. Quick power traverse is 75 in. per min.

Milling Machine, Plain All-Geared

Midgley & Sutcliffe, Bradford, England. [Vol.75,p.143E.] 91.

Table working surface is 33 in. by 9½ in., with self-acting longitudinal traverse of 24 in.,



which may be by hand, or hand and automatic. The largest diameter of cutter usable is 13 in. The machine may be either belt or motor driven.

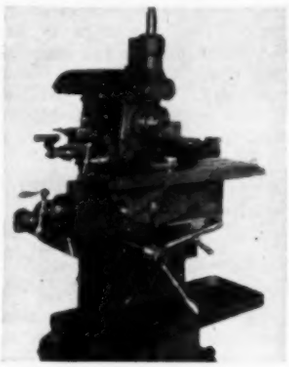
With the driving pulley running at 350 r.p.m. the six speeds range in geometric progression from 35 to 350 r.p.m. Gears are inclosed in the column and controlled by levers at the side. The feeds range from ¾ to 12½ in. per min., these being independent of the speeds. Trip dogs provide automatic knock-offs. The spindle is bored No. 4 Morse taper or No. 10 Brown & Sharpe taper. The cutter arbor is 1¼ in. The overarm is 3½ in.

Milling Machine

S. G. Jones, Ltd., Brixton Rd., London, S.W., England. [Vol.75,p.62E.] 59.

This small precision milling machine with direct motor drive is made by Christen & Co., Berne, Switzerland. A box-form overarm is now supplied with the machine so that heavier cuts can be taken. An inclinable table and also an inclinable attachment can be fitted in place of the normal table.

The slide has both longitudinal and vertical movements of 7⅞ in., the travel of the headstock being 5¾ in. Table working surface is 5¼ in. by 17¾ in., with a maximum inclination of 75 deg. The machine is made



with lever-operated slides for quantity-production, and with screw-operated slides for toolroom and experimental work.

Milling Machine Manufacturing

C. W. B. Crossley & Co., St. Mary's Gate, Manchester, England. [Vol.75,p.74E.] 62.

This manufacturing milling machine is made by the Rigid Milling Machine Co., Rorschach, Switzerland. The knee may be adjusted vertically without loosening bolts or clamping screws. Cuts requiring up to 15 hp. are taken in any position

of the cutter or table. A feature reducing idling time is the automatic control of intermittent slow and quick motion to the table. An automatic receding mechanism can be fitted to the knee to lower the table ⅜ in.

The table is 47¼ in. by 13 in. with automatic longitudinal feed of 35½ in. The spindle speeds range from 25 to 400 r.p.m. and feeds from ⅜ to 21 in. per min.

Milling Machine, Rotary-Head, Two-Spindle

W. Asquith, Ltd., Halifax, England. [Vol.75,p.23E] 38.

This machine was developed for milling the semi-circular flywheel housing flanges at the end of cylinder blocks, a boss being also milled at the same time. Two inserted-tooth face-cutter spindles are mounted in a drum

which rotates and traverses them across the work in a circular path. The work is carried in a special fixture. Working surface of the table is 3 ft. 8 in. long, by 2 ft. 4 in. wide. The cutters, both roughing and finishing, are 5 in. in diam. by 1¾ in. wide. The cutters are arranged at fixed centrs, that is 6¾ in. radius, so that the traverse varies according to the cutter size, the maximum path being 9⅜ in. and the minimum 4⅜ in.

Milling Machine, Thread

Power Plant Co., Ltd., West Drayton, Middlesex, England. [Vol.75,p.86E] 70.

The principle of this machine is that if two cylinders are rotated together, one being threaded and gashed to form cutting teeth, the feeding of the threaded cylinder against the plain cylinder will cut a thread on the latter exactly similar. As the hob is presented to the work a series of fresh cutting edges are constantly in action until the correct depth of thread is reached. Of course, if this were exactly true the thread contour would be composed of a series of arc-form facets of a

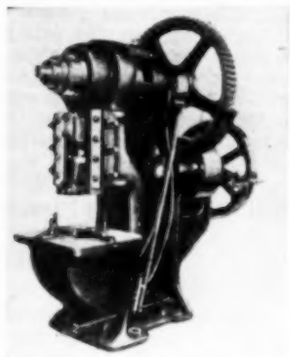
number equal to the number of gashes in the hob, and they would be joined together by ridges. However, by using a relative speed change of one in 200 for the hob and the work, a very good finish is obtained. Capacity is for complete oil well tubes and sockets from 4 to 11 in. Hydraulic operation is a feature.

Punching and Shearing Machines

Punch Press, Eccentric

F. J. Edwards, Ltd., Euston Rd., London, N.W., England. [Vol.75,p.61E] 57.

This geared eccentric power punch press has adjustment of the stroke through a range from 0 to 3¼ in. At the front the shaft is mounted in a double eccentric bushing which has teeth

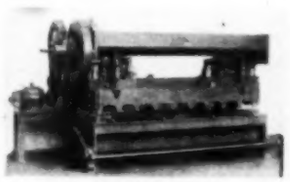


cut in its face. Each tooth represents an adjustment of ¼ in. Independent adjustment is provided to the ram for fine setting of the tools. Distance between the ram and table is 14 in.

Shear, Guillotine, Heavy-Duty

Henry Pels & Co., Ltd., Osnaburgh St., London, N.W., England. [Vol.75,p.53E] 54.

This guillotine shear will shear plates up to 100 in. by ½ in. thick in 30-ton tensile

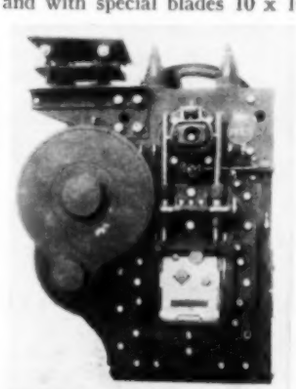


steel at one stroke. It has a 24-in. gap and a clearance between standards of 102 in. The hold-down is fully automatic. The height of stroke is 9 in., and the number of strokes per min. is 19.

Shear, Billet, and Bar Cropper

Henry Pels & Co., Ltd., Osnaburgh St., London, N. W. England. [Vol.75,p.97E.]

This billet shear and bar cropper with interchangeable blades will cut squares up to 3¼ in. on the side, rounds up to 4½ in., and flats in proportion, and with special blades 10 x 10



x ⅝ in. angles square across. The motor is 15 hp., and the shear gives 22 strokes per min., the strokes being 3½ in. The frame consists of two rolled steel plates, and the machine is double-geared.

Shear, Punch and Notcher, Portable

Henry Pels & Co., Ltd., Osnaburgh St., London, N.W., England. [Vol.75,p.42E] 52.

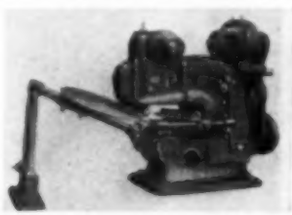
This portable splitting shear, punch and notcher, with bar, angle, and T-bevel cropper, will shear ⅜-in. plates and trim ½-in. plates, the length of the shear blades being 7⅞ in. The ma-

chine will also punch ¾-in. holes in ⅜-in. plates. Without changing blades it will crop 1-in. rounds and squares, 3x3x⅜ in. angles and T's on a square at 90 deg., and angles at all bevels up to 45 deg. in 2x2x¼-in. material. The machine makes 35 strokes per min. and requires 2 hp.

Cutting Machines, Circle, Curve and Strip

Hunton, Ltd., Fitzroy Court, London, W., England. [Vol.75, p.306E] 29.

These Weingarten figure, circle, curve and strip cutting machines have the cutters and shafts set obliquely. On the smaller types, speed changes are made by gears or variable friction drive, on the larger by gears and a stepped pulley on the motor or by a d.c. variable-speed



and a.c. motor. The top cutter is raised by a crank to permit the introduction of intricate shapes. On the larger machine adjustment is effected by a reversing motor. Attachments are fitted to perform the various cutting operations. The smallest machine has a gap of 29¾ in.

Other Machines

Casting Machine, Centrifugal

Craven Brothers (Manchester), Ltd., Reddish, Stockport, England. [Vol.75,p.305E]

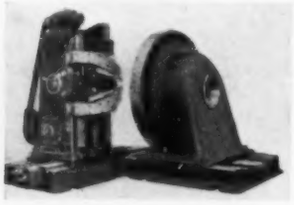
This centrifugal casting machine for manufacturing gear wheels, rings and other parts will make use of both ferrous and non-ferrous metals for parts 3 ft. in diam. A horizontal rotating table is bolted to a spindle which is carried in roller bearings and revolves at

definite speeds according to the diameter of ring to be cast. A top plate, permanently fixed in position, holds the cores down. With two locating rings continuous production can be obtained, one ring being loaded while the other is in the machine.

Cutting-Off Machine, Gate and Riser

Koping Engineering Works, Ltd., Koping, Sweden. [Vol. 75,p.31E] 42.

Gates and risers on heavy steel castings are cut off on this machine, being fastened by four jaws to the faceplate. A large hole is bored through the head so that heavy gears and other details with large hubs may be held. The head and faceplate

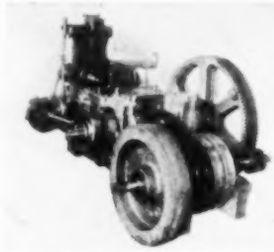


can be moved easily to the cutting position by a screw. The column carrying the cutting tools is also easily moved. The cutter-carrying ram works like a vertical shaper, and the tools cut both ways, the upper tool while the ram is moving downwards and the lower tool when the ram is going up, dead motion being eliminated.

Forging Machine, Nut, Automatic

H. Maplethorpe, Forward Works, West Bromwich, England. [Vol.75,p.99E.] 76.

To save scrap, this nut-forging machine uses round stock instead of rectangular-section or flat bars. It will produce ½- and ⅝-in. hexagon nuts at the rate of 50 per min. A bar of

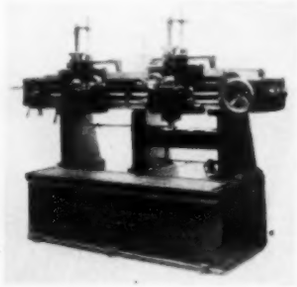


steel or iron is heated, placed in the shearing slide, and a piece is cut. This is lodged in the plate and carried around opposite the die, and on each stroke of the slide the nut is compressed into the die, punched, chamfered and ejected automatically.

Keyseating Machine, Axle, Two-Spindle

Carter & Wright, Halifax, England. [Vol.74,p.295E] 25.

The two keyseats in the rear axles for motor vehicles are cut simultaneously in this machine. Keyways up to 12 in. long by 1½ in. wide can be cut. Two vertical milling heads are mounted on the cross-slide. The bed forms a worktable with a

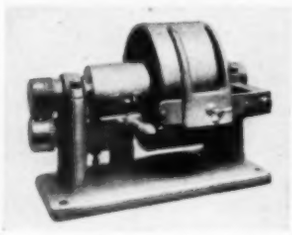


working surface 6½ ft. long by 12 in. wide. Maximum center-to-center distance of the spindles is 4¼ ft. and the minimum 3 ft. Drive is by 3½-hp. constant-speed motor.

Marking Machines, Metal-Box

John Ackworthie, Ltd., Coleshill St., Birmingham, England. [Vol.74,p.266E.] 10.

Marking machines are available for lettering on the outside of metal boxes of both circular and oval types. Boxes are

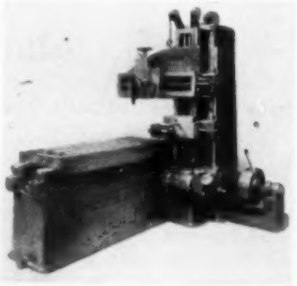


slipped over the lower block of the machine, the lower block being geared to the upper one. Hard steel inserts carrying the required lettering are fitted to the upper block and mark the box as the machine makes its revolution.

Planer, Open-Side, 48-In. Stroke

Butler Machine Tool Co., Ltd., Halifax, England. [Vol. 75,p.157E] 97.

Working surface of the worktable is 4 ft. long by 26 in. wide, and work 24 in. deep can be admitted under the cross-slide, while the width of work machined is 32 in. The stroke movement has a quick return,

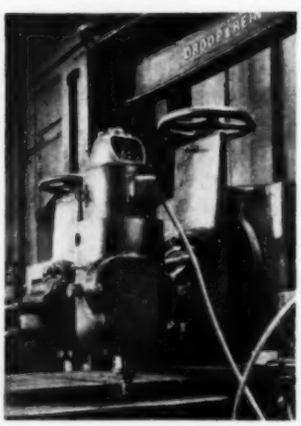


and the table moves on V-slides with automatic lubricators. The six table speeds are from 3 to 35 cycles per min. In addition to the toolbox on the balanced cross-slide there is a wide side toolbox fitted to the guide ways at the front of the box-section upright. This has a vertical adjustment of 21 in.

Milling Head for Planers

Droop & Rein Machine Tool Works, Bielefeld, Germany. [Vol.75,p.146E.] 94.

This self-contained auxiliary head can be attached to a planer



for milling purposes in order to do machining on relatively small faces which cannot be dealt with by planing as they require a motion rectangular to the travel of the planer table. The apparatus can be attached directly to the toolholder in the case of larger planers, or can be fastened on the vertical slide after removal of the box of the toolholder. It can be swiveled to any angle allowed by the saddles.

Polishing and Sanding Equipment

S. Wolf & Co., Ltd., 115 Southwark St., London, S.E., England. [Vol.75,p.40E.] 49.

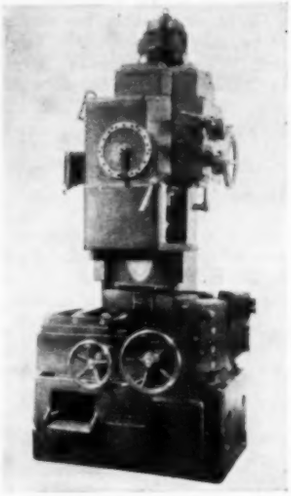
This flexible-shaft polishing and sanding equipment has accessories, including an angle head with water feed, a ball bearing head bored for No. 1 Morse taper shanks, an 8-in.

flexible felt backing disk with steel plate for attachment to angle head, a center fixing plate for disks, an 8-in. dish center sanding disk for use on felt backing disk, an 8-in. lambswool polishing wheel, a 4¾-in. wet grinding ring, a ball-bearing outer grinding handle with No. 1 Morse taper arbor, a wire scratch brush, and a ball-bearing sanding roller. Transmission from the armature spindle to the flexible shaft is by a four-step cone which gives speed of 700 to 3,200 r.p.m.

Sawing Machine, Cold, Vertical, Heller

Leo C. Steinle, Ltd., Marsham St., Westminster, S.W., England. [Vol.75,p.40E.] 48.

This vertical cold saw has a 14-in. blade, and will cut square or at an angle, the saw head swiveling through a complete circle. Ball and roller bearings are employed in the saw carriage, the saw spindle running in adjustable taper roller bearings. Two feeds are provided. Adjustable end and depth stops are provided, and the saw carriage



has a quick power return which operates automatically when the required depth of cut has been reached. The table is in the form of a self-centering vise. Hydraulic vises can be fitted. The machine will cut 7x3¼ in. T-beams in 38 sec.

Sawing Machine, Cold, Hydraulic

Leo C. Steinle, Ltd., Marsham St., Westminster, S.W., England. [Vol.75,p.84E.] 67.

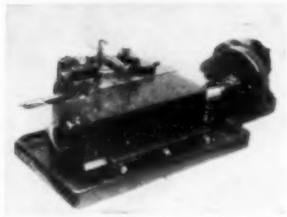
This Heller hydraulic cold saw will cut stock up to 5 in., and with the hydraulic gear the movement of but one lever will open the top and front vises, raise the stock lifter and move it forward, besides gripping.

The feed lever being then engaged, the cut is made and the carriage returns automatically to the starting position by rapid traverse. Feed of the saw carriage ranges from 0 to 16 in. per min. The blade cuts upwards, thus placing the stress downwards on the bed section. The hydraulic feed enables the cutting pressure to be adapted to the cutting capacity of the saw blade, and thus when working on round stock the machine can be kept working at full capacity throughout the section.

Sawing Machine, Bench, Portable

Carter & Wright, Halifax, England. [Vol.75,p.76E.] 64.

Available with either motor drive or belt drive, this sawing machine will cut mild steel 4 in. wide by ½ in. or 2½ by 1 in., and up to 1⅛ in. square and round. The lever at the front of the spindle automatically engages both the driving gear and feed motion. When the saw has traveled through the work the



operator throws back the lever and with his hand still on the lever draws the spindle head back to the out position, the driving gear being thrown out of action. The head with the saw has a traverse of 5 in.

Sawing Machine, Special, Duplex

John Holroyd & Co., Ltd., Milnrow, near Rochdale, England. [Vol.75,p.25E.] 40.

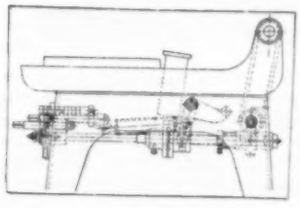
This machine is built for sawing turbine-blade packing pieces from steel bars, two lengths being dealt with simultaneously. The packing piece can be cut with both ends square or with one end square and the other

end angular, the lengths being controlled by an adjustable stop. After each piece has been sawed the stock feeds forward alternately and automatically and clamping is done by means of solenoids. Four saw spindles are employed, arranged in pairs of one fixed horizontal spindle and one spindle for the angular ends. The latter has axial and vertical adjustments.

Sawing Machine, Feed Governor for

E. G. Herbert, Ltd., Levenshulme, Manchester, England. [Vol.75,p.99E.] 77.

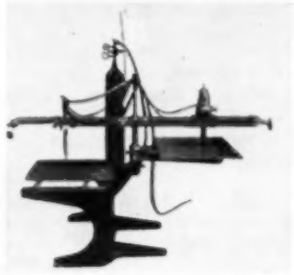
With this feed governor for Rapidor sawing machines, the feed of the saw tooth through the work is governed automatically as the cutting proceeds. When a thin section is met, resulting in the saw attempting to dig-in and feed much too quickly, the disks remain in contact, and thus the maximum feed of the saw is restricted to the maximum permitted by the movement of the disk along the screw. If wider cross-sections are again met, one disk moves away from the other disk and permits the feed to increase.



Shape Cutting Machine, "Reflex"

Hancock & Co. (Engineers), Ltd., Croydon, England. [Vol. 75,p.61E.] 58.

The burner and tracer are supported on crossheads which move on two parallel and horizontally supported bars. These bars are carried at the center by a bracket which is mounted



on a vertical post so that it can swing freely in a horizontal plane. The two crossheads are attached to the cable, and when the tracer is moved inwards towards the post the burner will also move inwards. When dealing with very large plates, the pivot post can be removed and placed directly on the workpiece.

Shaper, Punch and Die, Vertical, Thiel

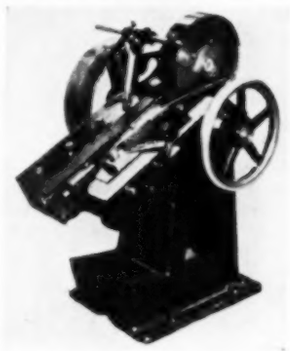
E. H. Jones (Machine Tools), Ltd., Baldwin Terrace, Islington, N., England. [Vol.75,p. 63E.] 60.

See p. 87, of the American section for review of this machine.

Thread-Rolling Machine

Grimston, Prichard & Plutte, Ltd., Swinton House, Gray's Inn Rd., London, W.C., England. [Vol.75,p.118E.] 81.

This machine will roll threads up to ⅜ in. diam. by 1¼ in. long. A straight-cut die is rolled past a stationary die with



the screw between the two surfaces, and the machine is hand-fed, the output being 65 screws per min. When rolling the thread the action is to keep the screw in a straight path. The fixed die block may be inclined at a small angle in relation to the face of the reciprocating die to allow free entry of the screw.

Washing and Drying Machine, Blueprint

Precision Photo Printing Plant, Ltd., Salisbury House, London Wall, E.C., England. [Vol.75,p.133E.] 88.

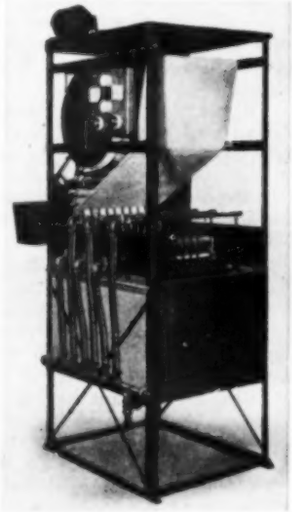
This automatic machine will wash, develop and dry blueprints in single sheets or in a continuous roll. One of the main features of the design is the

location of the drying drum above the tank, thus conserving floor space. Feed width is 46 in. and the speed of the conveyor belt is 5 to 8 ft. per min.

Washing and Drying Machine, Blueprint

Precision Photo Printing Plant, Ltd., Salisbury House, London Wall, E.C., England. [Vol.75,p.157E.] 98.

This automatic machine washes the prints free of hypo



and drys them in one continuous operation. The print passes through three separate tanks so that it is progressively cleaned in its travel. It next goes over a drying drum at the top. The machine has a feed width of 19 in. and the feed is at 1 to 3 ft. per min. The floor space occupied is 29 by 38 in.

Small Tools

Diestock, Ratchet

Mosers, Ltd., 4 Marshalsea Road, London, S.E., England. [Vol.75,p.134E.] 89.

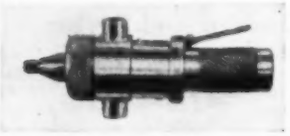
This ratchet-pattern chaser diestock is made by Easterbrook, Allcard & Co., Ltd., Sheffield, and is distributed by the above company. It is made in several sizes to thread British standard pipe threads up to 4

in. A full thread can be cut in one operation, or two or more cuts can be taken. A feature is the automatic releasing mechanism, operated by simply pressing a knob on top of the cam-plate.

Flexible Shaft Attachments

Flextol Engineering Co., Ltd., 18 Dartmouth St., Westminster, S.W., England. [Vol.75,p.96E.] 71.

The Type B.L. handpiece is intended for light drilling, grinding, sanding, polishing and milling. It will take a ¼-in. drill chuck, but accommodates drills up to ⅜ in. No speed reduction

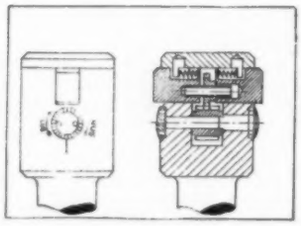


is fitted. For grinding, a spindle can be fitted to take 6 in. wheels. For polishing, an adaptor is available with a standard taper thread. Another Type B.L. handpiece may be fitted with a speed-reduction gear to give either a 30 to 1 or 15 to 1 ratio.

Reamers, Floating, Adjustable

D. Brown & Sons, Ltd., Huddersfield, England. [Vo.75,p. 120E.] 84.

In this adjustable floating reamer two cutters are used, each fitting a transverse slot in the reamer body and each capable of radial motion in the slot. This reamer is made in 19 sizes, the smallest having a range of from 1 to 1⅛ in., and the largest from 20 to 24 in. A cover retains the blades in place, and pins form abutments

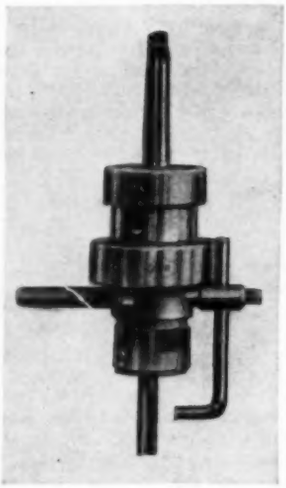


for springs that press the blades inward. One blade operates on a screw with an adjusting nut. The nut can be rotated by the pinion, the graduated spindle for which shows divisions corresponding to a variation of 0.001.

Tapping Attachment, Efem

Eugen Fahrion, Esslingen-Mettingen, Germany. [Vol.75, p.25E.] 39.

This tapping attachment can be used for through holes and blind holes by using standard taps. The laterally projecting rod bears against the machine frame and thus maintains the



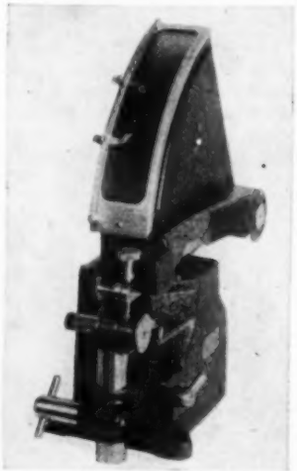
center part of the attachment stationary. When the tap enters the hole the spindle is automatically drawn down until the thread is cut. The tap spindle is driven downward by a catch working in conjunction with a coupling cam. When the tap reaches the depth required as set by an adjustable stop, the coupling cam is automatically disengaged and the tap stops. Raising the spindles causes planetary gears to withdraw the tap at twice the tapping speed. The attachment is available in eight sizes for threads from ¼ in. to 2 in. Whitworth.

Gaging, Inspecting and Testing Equipment

Comparator, Mirror-Type "Microlux"

E. H. Jones (Machine Tools), Ltd., Islington, N., England. [Vol.75,p.41E.] 50.

Rapid inspection of machined parts up to 2 in. diam. can be done with this "Microlux" mirror comparator made by Fritz Werner, A.G., Berlin. Two types are essentially the same, but one has an anvil which is adjustable vertically and the other an anvil which is adjustable both vertically and lengthwise as illustrated. The workpiece is located against a back face, where a contact screw is brought down to bear with a pressure independent of the feel of the operator. The result is shown on a frosted glass window by a dark line against a circle of light. The comparator will indicate errors up to 0.006 in. It can also be used for the inspection of threads.



Comparator, Screw-Thread

Easterbrook, Allcard & Co., Ltd., Sheffield, England. [Vol. 75,p.180E.] 107.

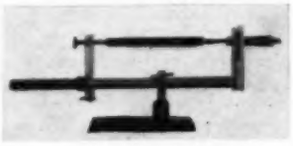
For measuring the pitch of screw threads, this instrument employs the principle of transferring a known measurement to the screw, the amount of error being shown on a dial.

The stylus employed is of the same form as the thread to be measured, and the setting stylus is adjusted so that the dial indicator reads zero. The comparator bar is slidably mounted so that by taking readings inch by inch or thread by thread errors may be definitely tabulated as progressive or aperiodic. The machine has a length range of from 2 to 24 in., the maximum diameter taken being 5 in.

Micrometer

H. C. Chambers, Beighton, near Sheffield, England. [Vol. 74,p.283E.] 17.

This "Neo-Micrometer" is made in two forms, a light type to measure rods from zero to 12 in. long and gaps from 6 to 16 in. and their metric equivalents, and a heavy type for lengths up to 40 in. and gaps from 6 to 48 in., also with their metrical equivalents. In the light machine a beam carried by a bracket supports at one end



an arm serving as a micrometer. A movable arm on the beam carries an adjustable anvil; the gap between the anvil and the micrometer is set by means of standardized rods. Internal measurements are taken by reversing the micrometer head and the anvil in their carrying arms. A translator gage is then needed.

Spirit Level, Adjustable

Cooke, Troughton & Simms, Ltd., Buckingham Works, York, England. [Vol.75,p.97E.] 74.

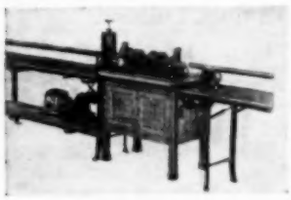
This adjustable spirit level is 8 in. long and has 120-deg. V-angle. It will readily measure the inclination of a shaft or surface to 3 deg. elevation and 2 deg. depression. The gradient

is expressed in thousandths of an in. per ft. and is easily read off by means of a divided drum. In some cases the micrometer head has been provided with a scale reading to 10 sec. direct. A small circular spirit level in a brass mount facilitates cross leveling.

Magnetic Analyser

Equipment & Engineering Co., Ltd., 2 & 3 Norfolk St., Strand, W.C., England. [Vol. 75,p.83E.] 65.

Bars up to 4 in. can be examined with this magnetic analyser. In principle the equipment takes two similar pieces of iron or steel and places

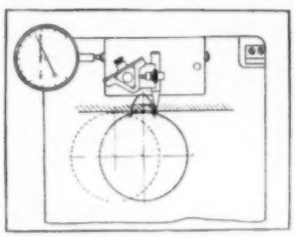


them within two similar coils connected in series. Each coil has the same number of turns and can give the same magnetic effect in the pieces. If one piece contains a flaw or is of different granular structure the magnetic effect differs. By adding a secondary winding the inductive intensities of the magnetism can be noted and the respective values compared. Usually an oscillograph of the visual type is employed, and the indication is given on a screen.

Testing Instrument, Gear-Tooth, Involute

D. Brown & Sons, Ltd., Lockwood, Huddersfield, England. [Vol.75,p.98E.] 75.

This instrument can be applied to spur and helical gears and wormwheels up to 12-in. base circle. It indicates 0.0001 in. deviation of the tooth form from the correct involute. The gear blank is mounted on a base disk, which slides freely

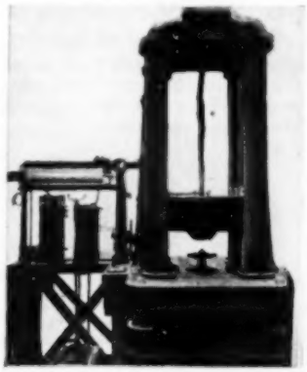


on the flat base of the instrument, and in addition to this there is only one point of rolling contact between the gear to be tested and the gaging point. The base disk is in contact with the straight edge and the stylus point is in contact with the involute. If now the base disk be rolled along until the center shifts to the left, the stylus, if the involute is correct, will still occupy the same position when in contact with the tooth profile, and the dial indicator will remain at zero.

Testing Machine, Wire-Rope, 1,000,000-Lb.

W. & T. Avery, Ltd., Birmingham, England. [Vol.75,p.170E.] 101.

This vertical testing machine employing a compound lever system will perform tensile tests on wire rope specimens up to 11 in. in circumference by 6 ft. long unstretched, its capacity being 1,000,000 lb. The strain is applied by a reversible motor. A recoil plate keeps the grips in position and takes up



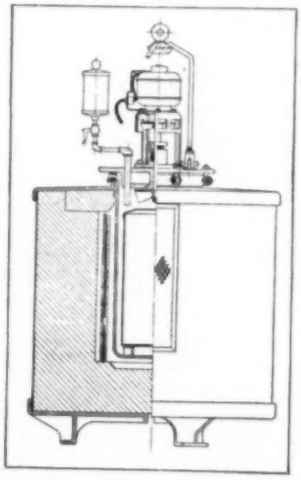
the reaction when the breaking point is reached. A split poise is fitted, so that by using the small poise finer readings can be obtained in conjunction with lower capacity tests. An autographic recording apparatus and an electrically controlled and propelled poise are provided.

Furnaces and Equipment

Furnace, Carburizing "Carbonal"

Wild-Barfield Electric Furnaces, Ltd., North Road, Holloway, N., England. [Vol.74,p.275E.] 12.

This "Carbonal" carburizing furnace, built by the Hevi Duty Electric Co., Milwaukee, Wis., is represented in England by the above concern. The charge is loaded in a basket which is placed inside the heat-resisting alloy retort, fitted with a special cover. A fan circulates the carburizing gases. When work is brought up to the carburizing temperature of 940 deg. C. or thereabouts, the Carbonal compound is introduced into the hot retort by means of a drip-feed attachment and is cracked up into hydro-carbon gases. Penetration is at a rate of 0.012 in. to 0.015 in. per hr. at 930 deg. C.



Furnace, Hardening, Pusher-Type

Wild-Barfield Electric Furnaces, Ltd., North Rd., Holloway, N., England. [Vol.75,p.64E.] 61.

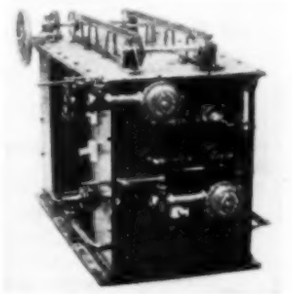
This pusher-type electric furnace is for hardening or normalizing small cylindrical parts. Two V-channels take two continuous rows of parts. The furnace is tilted in order to overcome any sticking of the heated work in the channels. The furnace chamber is 4x4x48 in., and

has a total load of 4.5 kw. for operation on 200-220-volt single-phase or three-phase circuits. When working with pieces ½ in. diam. by 4 in. long at a feed rate of one push per min. an output of about 30 lb. per hr. is obtained.

Furnace, Hardening, Hacksaw-Blade

British Furnaces, Ltd., Derby Rd., Chesterfield, England. [Vol. 75,p.6E.] 34.

This hacksaw hardening furnace takes blades up to 24 in. long of carbon or high-speed steel. The furnace chamber is a muffle, having internal dimensions of 9 in. wide by 2 ft. 6 in. deep. The burners are ar-

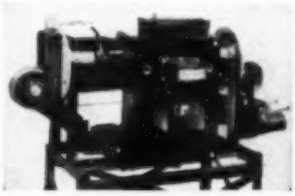


ranged at the rear of the furnace and fire behind the muffle. The hot gases pass through passages in the bottom and side walls of the furnace and issue through a flue at the opposite end. Special alloy carriers take six blades each, the carriers being suspended from cross bars placed across two roller chains. Moving of the blades through the furnace chamber is accomplished by a hand-operated driving gear at the left. Any time cycle can be worked to. Both carbon and high-speed steel blades can be heat-treated.

Furnace, Conveyor-Type, for Aluminum Disks

Wild-Barfield Electric Furnaces, Ltd., North Rd., Holloway, N., England. [Vol.74,p.315E.] 30.

Two continuous bands of nickel-chrome ribbon carry the aluminum disks through this furnace. Drive is furnished by a ¾-hp. motor by means of chain and sprockets. The rate of



travel of conveyor and work is adjustable between 12 to 20 in. per min. An automatic control of the thermo-electric type is furnished. The furnace is portable.

Pyrometer, Radiation

Elliott Bros. (London), Ltd., Lewisham, S.E., England. [Vol. 74,p.255E.] 6.

This company is manufacturing the Siemens Ardometer, which is a total radiation pyrometer for measuring high temperatures. The indicators or

recorders used are in six standard ranges, the lowest being 500 to 1,000 deg. C. and the highest from 1,000 to 2,000 deg. C. A lens focuses the heat radiation from the hot body, the temperature of which is to be measured on the thermocouple. At the other end of the instrument is an eye-piece, a small absorption screen being placed between. The thermocouples are connected through a twin copper cable to a millivoltmeter or to a recording millivoltmeter. A reading can be obtained in five seconds. The instrument is available in portable and fixed types. It can be attached to a conical indicator below (as illustrated), designed to be read from the front or top.

Miscellaneous Equipment

Monorail Transporting Device, Aero-Cycle

George W. King, Ltd., Hartford Works, Hitchin, Herts, England. [Vol.75,p.120E.] 85.

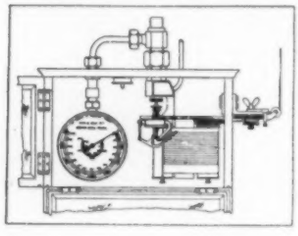
This U-form steel structure is suspended on the monorail by rollers, one roller being geared to a vertical driving shaft. The operator sits in the saddle and moves the device along the

monorail by pedaling. The machine is available with or without a pedal hoisting mechanism. Loads up to one ton can be handled. The over-all length is 4 ft. 6 in., the over-all width 2 ft. and the clearance required from the center line of the track 6 ft. The speed is about 6 miles per hr.

Press Recorder, Hydraulic

Dobbie McInnes & Clyde, Ltd., Bothwell St., Glasgow, Scotland. [Vol.75,p.31E.] 41.

A device for recording the total force and the unit pressure exerted on a hydraulic ram at

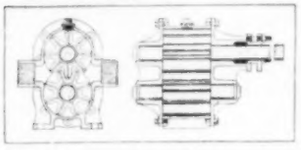


all points of its stroke has been offered. It consists of three main units, the gage, the recorder and the reducing gear. The pressure gage is fitted with a maximum recorder graduated both in tons force on the ram and also in pressure in lb. per sq.in. The latter is of the engine indicator type, a diagram being drawn on a paper strip by a pen arm.

Pumps, Gear

Albany Engineering Co., Ltd. (Salaman, Handoll, Ltd.), Ossory Rd., London, S.E., England. [Vol.75,p.179E.] 106.

The chief feature of these pumps is the provision of hydraulic seals to each tooth of both impellers by cutting radial grooves on both faces and also along the top of each tooth.

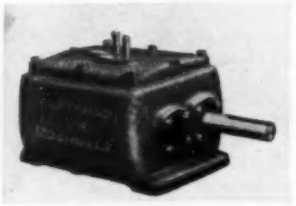


The grooves are always filled with the liquid and their contacts with the bore and sides of the pump form the hydraulic seals. The pumps are made in seven sizes from ¼ to 1¼ in. capacity in both high- and low-speed types. Outputs range from 10 to 1,000 gal. per hr. Sizes up to ½ in. capacity are capable of maintaining pressures of 60 lb. per sq.in., and larger sizes will give pressures up to 150 lb. per sq.in. For heavier duty a back-gear type of pump is available in from ¾- to 7-in. capacity, with outputs up to 50,000 gal. per hr.

Speed Reducers

Matterson, Ltd., Shawclough, Rochdale, England. [Vol.75,p. 33E.] 45.

Speed reducers using sliding gears and others using friction clutches have been developed. The sliding-gear box is made in

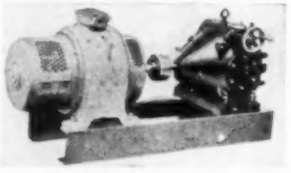


six sizes giving four or six changes of speed, the maximum range with four-speed boxes being 1 to 1 to 4 to 1, and with six-speed boxes from 1 to 1 to 6 to 1 reduction. Where the changes of speed have to be instantaneous, boxes with cone friction clutches are available, each with two control levers. Two sizes are made, each with four changes, the larger transmitting up to 18 hp.

Speed Reducer, Infinitely-Variable and Reversible, Friction-Type

Diskon Gear, Ltd., 64 Victoria St., Westminster, S.W., England. [Vol.75,p.109E.] 80.

The device employs two rollers, on the inner face of which are cut bevel gear teeth that mesh with a set of four epicyclic bevel pinions carried in the

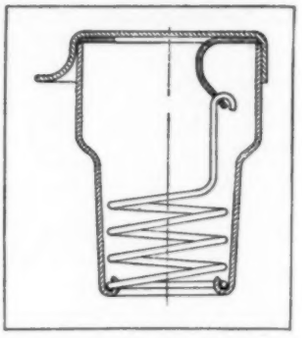


cage, thus forming a driving connection between the two rollers. The cage is fixed to one end of the inner output shaft, and the other end is slidably connected to the outer output shaft. The rollers are set at equal distances on each side of the friction disk center and therefore rotate at equal speeds in opposite directions. When the whole frame containing the rollers and planet pinions has been moved laterally, the rollers are rotated at different speeds in opposite directions and to accommodate the difference the cage drives the output shaft through the epicyclic pinions.

Oil Cup, Linham

G. H. Alexander Machinery, Ltd., Coleshill St., Birmingham, England. [Vol.75,p.6E.] 35.

This oil cup, made by Linham Akitebolaget, Stockholm, consists of three parts, namely, a lid, a body and a spring. The oil cup is made in two forms, one being as illustrated, with the



lower part conical to fit into a slightly tapered hole. Where the material which carries the lubricator is thin, the lower part of the body is threaded and can be secured in a tapped hole. The taper-body lubricator is made in three sizes, the largest of which is ⅜ in. in diameter in the small end of the body, whereas the threaded lubricator can be had in two sizes.

Truck, Motorcycle-Type

Raleigh Cycle Co., Ltd., Nottingham, England. [Vol.74,p. 295E.] 24.

This combination truck and motorcycle has one front wheel and two rear wheels. The rear part of the vehicle is built with

four quarter-elliptic springs on which any type of body can be fitted. The wheelbase is 5½ ft., track 3½ ft., and ground clearance 5 in. Weight capacity is 500 lb. A trailer mounted on two wheels can be attached to the transport truck.

Automotive Plants Lead In Increased Production

Steel Mills — General Motors — Studebaker — Lycoming—National Cash—Graham—all active

New truck sales by General Motors Corp. in November showed an increase of 68 per cent over the corresponding 1930 month. . . AC Spark Plug Co. has employment 37 per cent ahead of a year ago, in some departments as much as 300 per cent ahead. . . December sales of Studebaker and its subsidiaries were more than 50 per cent in excess of December, 1929, and more than 100 per cent ahead of December, 1930. . . Combined sales of all makes of General Motors passenger cars and trucks to fleet users showed unit gains of 8 per cent in September over 1930, 30 per cent in October, and 14 per cent in November. . . Graham-Paige Motors Corp. has added 900 employees recently to its Detroit and Wayne plants. . . Chevrolet sales during December set a new all-time high record for the month. . . Lycoming Mfg. Co., division of Cord Corp., has increased foundry production 100 per cent. . . Steel activity is increasing: 16 mills at the Laughlin plant of American Sheet & Tin Plate Co. resumed operations; Carnegie Steel Co. has reopened a blast furnace in Ohio; Republic Steel Corp. started eight sheet mills at Niles last week; Allegheny Steel Co. No. 1 plant at Brackenridge, Pa., resumed operations after being idle a month. . . Continental Steel has reopened its rod mill and started two open hearths at Kokomo. . . Industrial payrolls in a number of Milwaukee plants have been increased as a result of the recent Allis-Chalmers Co. order from Pennsylvania railroad for 240 electric locomotives. . . Railroads are starting to buy materials in larger quantities. Colorado Fuel & Iron Co. has been ordered by Great Northern Railway Co. to complete an order for 1,250 tons of rails, delivery of which had been postponed.

Sheet and strip mills of Republic Steel Corp., Youngstown, Ohio, have increase operations as a result of releases on first-quarter automotive contracts for sheet. All three strip mills at Warren are in partial operation and the sheet mills at Niles resumed work Jan. 12. Mahoning Valley Steel Co. resumed operations last week. Sharon Steel Hoop Co. has stepped up production to 50 per cent of capacity, chiefly on automobile sheet and strip. Youngstown Sheet & Tube likewise reports more activity in its sheet mills, due to automobile releases.

National Cash Register Co., Dayton, Ohio, has received orders for 2,000 machines aggregating several hundred thousand dollars, according to an announcement by FREDERICK B. PATTERSON, president.

Chrysler Corp. plans immediate construction of $2,000,000 to $3,000,000 assembly plant at Los Angeles, according to statement by WALTER P. CHRYSLER, president. The plant will cover 30 acres.

More than 1,000 employees of Colorado Fuel & Iron Co. will return to work within a few days when operations in five major departments of Pueblo steel mills are resumed.

FRANKLIN H. FOWLER
New President, Foote Bros. Gear & Machine Co.

Farrell to Retire As U. S. Steel Head

JAMES A. FARRELL, 69, president of United States Steel Corp., has announced his intention to retire April 18. The announcement was made on the twenty-first anniversary of his election as president, and on April 1 he will have been in the service of the corporation for more than 50 years. He will remain a member of the board and will continue to concern himself with its affairs; however, control will be taken over by younger men.

On the eve of his retirement he summoned the first convention of the National Foreign Trade Council to be held outside the continental borders of the United States. Mr. Farrell, who is chairman of the council, asked it to meet in Honolulu, May 4, 5, and 6.

Ordnance Committee Meets in New York

LIEUT COL. A. F. MASURY, Specialists' Reserve, Chairman of the Ordnance Advisory Committee, SAE, with the approval of the Secretary of War, called the twenty-fifth meeting of that committee in New York City, Jan. 14, 15, and 16. The program included consideration of the designs of light tanks and combat cars, recent designs of rubber-jointed tracks, light removable half tracks for 6-wheeled vehicles, the question of development and fabrication of armor plate bodies of combat vehicles, discussion of the results of tests of the Convertible Medium Tank T3, the commercial possibilities of certain European developments, the possibilities of commercial 6-wheel-drive trucks for military work, and use of commercial units such as clutches.

Bryant Organizes Machine Tool Outlet

A. G. BRYANT, general manager, Machinery Division, Joseph T. Ryerson & Son, Inc., Chicago, resigned Dec. 31 (*AM*—last week) to become president of the newly organized Bryant Machinery & Engineering Co., Chicago Daily News Bldg., 400 W. Madison St. He had been identified with Ryerson for 20 years, and for the past two years was secretary-treasurer of Associated Machine Tool Dealers.

Bryant Machinery & Engineering Co. will serve a group of machinery manufacturers as their consolidated sales department. For these companies it will assume the responsibilities of sales engineering and management, advertising direction and general distribution for all territories. In some localities, it will function as dealer in selling to the trade; in other districts representation will be given through appointed, exclusive machine tool dealers.

The company will concentrate on a few lines, such as: multi-duty radial boring and drilling machines manufactured by Dreses Machine Tool Co.; special production and heavy-duty drills built by Green Bay Barker Machine & Tool Works; Kling Brothers Engineering Works' high-speed friction saws (formerly Ryerson) and the products of Ohio Machine Tool Co., including: standard and special railroad shapers, planers and horizontal boring, drilling and milling machines in floor, table and combination types. Special-purpose machinery and welding equipment, including electric arc, flash and spot-welding machines and accessories will also be important parts of the business.

Others active in the management of the company are: A. P. SCHUMANN, formerly sales manager Machinery Division, Joseph T. Ryerson & Son, Inc.; IRA B. YATES, formerly chief engineer, Machinery Division, Joseph T. Ryerson & Son, Inc., and M. J. WIORA, formerly office manager, Machinery Division.

Progress in Metal-Working and Machinery Markets

NEW YEAR uncertainties still raise questions among machine tool builders and dealers . . . Auto Show results, trend of general business, Wall Street prices, and a dozen other old-time auguries are being watched anxiously, but apparently independent of these signs, the tool market goes up and down as it wishes . . . This week New York is the cheerful market, possibly due to the Auto Show, possibly largely by comparison with previous downcast weeks . . . A live inquiry for 22 tools, many other inquiries, an upturn in sales — all are New York's; other districts have little cheerful beyond a revival of interest . . . N. M. T. B. A. reports show domestic steadiness since October, exhibiting December figures that continue the upward trend . . . Foreign business has caused most of the index decline . . . now is less than 10 per cent of total business.

NEW YORK is cheerful; the Auto Show was proclaimed a success . . . Detroit awaits this news and that of Chicago Show trends . . . January there has been a dull month, except for Ford purchases, also felt in New England, where Ford placed 30 units . . . Cincinnati has Detroit order for several small lathes, some scattering automotive tool purchases, some single orders from small users, much belief in the "psychology" of current relief plans . . . Chicago is experiencing revivals in inquiries and good small-tool and part demand, but new inquiries and sales just won't appear . . . New England is stimulated but conservative.

INDIANAPOLIS, as do other sections, looks hopefully toward the Auto Shows . . . Some buying of miscellaneous items is anticipated . . . Canada has better demand resulting from bettered industrial conditions . . . Southern District sales continue scattered and without variety, facing principally small tool demand and several forms of price concessions.

NEW YORK

"A little better" is the general verdict of tool men here. For some, no change occurred, but several dealers experienced an upturn and a reawakening in inquiries, some of them accompanied by sales. One dealer closed on the new and second-hand equipment for fitting out a small shop; another has a live inquiry for 22 tools on top of a stack of other inquiries and an exceptionally good week in sales. General opinion holds that things will be looking better from now on.

DETROIT

Not much change is expected here until the automobile manufacturers have had an opportunity to feel the effects of the New York and Chicago auto shows. When the manufacturers begin to get orders from their dealers they will understand the sales possibilities of the year much better than they do now, and will probably make purchases of machinery and machine tools in accordance with the prospects. January has been a dull month, as it was expected to be. Only a few scattered sales have been reported and these, for the most part, are unimportant. Dealers are making very few guesses as to the future and most of the guesses are made cautiously. A great deal of attention is being concentrated on the Ford Motor Company which has recently been in the market for some equipment.

CINCINNATI

Some machine tool manufacturers express the opinion that the announcement of plans to ameliorate the business situation is creating a better psychological condition, thus tending to reduce sales-resistance. An order from Detroit called for several small lathes, used in vocational training in public schools. Automobile and parts makers made a few scattering purchases, and a small volume of single orders came from miscellaneous users. Buying against outstanding inquiries is postponed.

CHICAGO

Indications that a revival of interest is being taken in inquiries long pending is reported; apart from this the machine tool situation is featureless. Few new inquiries are being received, and such sales as are being made represent persistent follow up activities on the part of sales forces. Demand for small tools and parts continues fairly good, auto builders and manufacturers of accessories being principal buyers. Dealers specializing in used tools report inquiries scarce, and the sale of any important unit is regarded as an event. Prospects for business in the near future seem somewhat discouraging.

NEW ENGLAND

A slow but definite upturn in business has stimulated machine tool trading enough to assure the anticipated January improvement. Bone-tight conservatism in budgeting, however, does not promise a wide machinery rejuvenating program.

Automotive buying is the chief source of improvement. Ford has placed orders for equipment for his Detroit and Canadian plants totaling 30 units. Large automatic production units of special design are included in automotive orders, with Connecticut and Massachusetts companies favored.

INDIANAPOLIS

Even though it is far removed, the automobile show in New York has attracted more than usual attention from the Indiana machinery and machine tool trade.

And the outlook is much better. Judging from the enormous volume of road construction planned for next year, contractors will have to get into the market for equipment. The railroads having been out of the market for two years, will need new tools. At present there are some widely scattered orders and more inquiries than a year ago. Another bright spot this year will be the stone and the sand and gravel industries.

CANADA

Demand for machinery and machine tools is better than at this time last year. There has been a notable pick-up in sales during the last fortnight, and prospects for a steady recovery of business appear bright. Most automobile plants have considerably augmented their working forces. Conditions in the used car markets are good, and replacement parts continue in fair demand. Electrical and mining machinery are moving freely, and extensive undertakings in the gold producing areas give promise of further developments in this trade. Tire and rubber plants are working at close to capacity.

SOUTHERN DISTRICT

The first ten days of 1932 saw relatively little change among the machinery and machine tool trade. Sales continued scattered and of a small tool variety. All centers of activity experienced a pronounced dullness toward the end of the year, recovery from which is not anticipated or predicted for the first few months of this year. Prices continue to hold up, but the issue appears to be a moral rather than a practical one, for concessions in one form or another serve the same purpose as price slashing. Little business of consequence is reported from the oil fields, railroads and shipyards are exceedingly quiet, with spasmodic inquiry from these latter markets and then only of a small nature. Small tool sales predominate.

WEEK BY WEEK

The Business Barometer

Trends in General Business throughout the world

THEODORE H. PRICE
Editor, Commerce and Finance, New York

WHAT the economists like to call the "price equation" includes three major elements, one the facts, the second the concrete effect of these facts upon supply and demand, and third the mental attitude of the public toward the changes indicated. Of these three elements the third is often most important and influential. This is because the present is constantly being merged with the past, and men are always trying to anticipate the future.

This is peculiarly true of last week's developments. Probably most important news was a Jan. 12 Washington dispatch to the New York Journal of Commerce, which is over a hundred years old and bears a name that is the synonym for conservatism. It stated that:

"Among the economic proposals receiving much attention and one which probably was taken up at the meeting was that of a further easing of the credit situation possibly through some type of inflation by issuance of a greater volume of Federal Reserve notes.

"Some inflation would prove beneficial, it is held, although those opposing such a program pointed to the danger of its getting out of control and causing more harm than good. The theory of inflation would be to cause an increase in commodity prices, necessary to restoration of good business conditions, in the view of some experts."

Soon after publication of this dispatch it was announced that the Federal Reserve Bank of New York had launched a new effort to stimulate credit expansion and turn the trend of commodity and security prices by reducing its buying rate on bankers' acceptances ½ to ¼ per cent. This has started considerable talk of an impending reduction in the New York rediscount rate.

Stimulating in Effect

The significance of the foregoing is not yet fully appreciated by the general public. Its effect, however, is certain to be stimulating, although there are some who regard inflation as a wicked word that connotes monetary changes that ought to be avoided. This covers about all that can be said with regard to the economic imponderables that should be considered in appraising the current situation.

The stock market has been somewhat firmer and bonds have shown a refreshing steadiness. Congress is acting with greater promptitude than many had expected in passing the relief measures asked for by the President, and it seems reasonably certain that the Government will be in a position to supply solvent though hard-pressed banks with the funds that they require.

The epidemic of bank failures which spread over the country during 1931 included over 2,300 banks with net deposits of more than $1,500,000,000. Nothing like it has ever been known in the United States or elsewhere, and it seems certain to provoke the passage of some drastic laws designed to prevent the repetition of such a debacle.

The commodity markets show but little change. Retail trade throughout the United States is said to be better, but the figures available are not conclusive.

Less Internationalism

American interest in the international situation and the debt settlement is less excited than it was. Most people on this side of the Atlantic seem disposed to await developments. It is assumed by many that Chancellor Bruening was playing politics when he announced that Germany could not make further payments on account of her reparation indebtedness. In England and France as well as in Italy there are also some who threaten "chaos or repudiation" but this view has no official endorsement as yet and a great many conferences will probably have to be held before any definite settlement of the many questions involved can be arrived at. Patience is, therefore, counseled while the result of these conferences is awaited.

The news from the Far East indicates that Japan is gradually occupying the whole of Manchuria, and that she has not yet encountered any real opposition from the Chinese Government, if indeed there is such a government. In the circumstances the League of Nations seems impotent, although Japan continues to treat its communications with respectful consideration.

Taken in its entirety the outlook is more reassuring than it was, and the spirit of cheerfulness seems to be spreading despite the suffering of some who are still grieving over the losses sustained since 1929. To be always grieving is, however abnormal, and if it were possible to chart the territory of optimism we should probably be surprised at its recent enlargement.

It is interesting to observe that the members of the House and Senate have thus far introduced 11,000 bills to the present Congress. It is said that at least 3,000 of these bills contemplate the expenditure of money that must be raised by selling bonds or imposing taxes. Of course, it is unlikely that many of these bills will be passed, but there is no doubt that President Hoover is sound in urging a reduction in public expenditure.

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THE BUSINESS WEEK

January 22, 1932

The year has started with considerably more snap than was expected, though less than in '30 and '31. . . . The first full week's records do not indicate any definite turn in industrial and business activity, but they show some response to seasonal stimulus in steel and the cotton trade, and at least resistance to further recession in almost all lines. . . . Commodity prices continue encouragingly steady. . . . Active interest in the auto show has aroused more optimistic estimates of spring output. . . . Power production, carloadings, construction projects are still slack. . . . The first half of January has been distinguished chiefly by pronounced improvement in securities markets, principally in rails and especially in bond prices. . . . Some of this is usual at the season, but most of it is undoubtedly due to improvement in railroad prospects, high hopes of early relief from banking strain through the Reconstruction Finance Corporation, and recent expectations of rigorous reversal of passive Federal Reserve policy in face of destructive deflation. . . . Moves toward easier money rates in the New York market have stimulated speculation on the possibility that the Reserve banks will embark on aggressive open-market operations to force member bank credit expansion and facilitate federal financing. . . . This is important if true, but it is too early to tell whether it is, and whether it will be effective. . . . Political and popular pressure toward expansion is powerful and may prove irresistible; but the response of banking authorities to the inevitable has been so belated and the credit mechanism so crippled by lack of confidence that some form of more direct inflation may be forced upon us if the commercial banks cannot or do not cooperate in carrying out Reserve policy.

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• PERSONALS •

WILLIAM E. UMSTATTD has been made executive vice-president of The Timken Roller Bearing Co., Canton, Ohio. He has been with the company thirteen years, the last two years as factory manager.

HENRY H. TIMKEN, JR. has been made assistant to the president, Timken Steel & Tube Co., Canton, Ohio, according to an announcement by FRED J. GRIFFITHS, president. Mr. Timken has been serving as assistant works manager of Timken Roller Bearing Co. for the past two years.

W. R. STEUBING, JR., has been appointed receiver for Bradford Machine Tool Co., 657-671 Evans St., Cincinnati, Ohio. It is the receiver's intention to continue to operate the business.

E. H. MCCARTY has been elected president of Nash Motors Co. He was formerly vice-president and general manager and succeeds as president C. W. NASH, who has been both president and chairman of the board and will retain the latter office. H. E. LONG has been made vice-president and director of purchases and ROBERT B. ELLIOTT, vice-president in charge of operations.

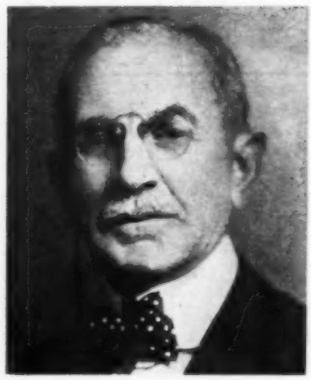
E. J. LEES has joined National Tool Co., Cleveland, Ohio, as an engineer.

ALFRED M. SMITH has been elected president of Tubular Products Co., Southington, Conn., recently reorganized. Present lines, which include automobile brass tubes for oil lines, water headers, ignition and specialties, will be continued. Other officers are CHARLES B. SIMMONS, vice-president; CLIFTON I. STONE, secretary; ORVILLE H. BAILEY, general manager.

WARD H. PRESTON has been elected president and general manager of Papec Machine Co., Shortsville, N. Y.

• OBITUARIES •

MAX E. R. TOLTZ, 75, consulting engineer and president of Toltz Engineering Co., St. Paul, and later of its successor, Toltz, King & Day, Inc., died in St. Paul, Jan. 11. Mr. Toltz served a short apprenticeship with a Berlin firm dealing in pumps and waterworks equipment and was connected with the Prussian government as assistant engineer until he came to the United States in 1882. He was naturalized in 1892. During his first twenty-five years in the United States he was connected with several railroads, notably Great Northern, of which at one time he was chief mechanical engineer. He was a consultant for Canadian Pacific, for Butte, Anaconda & Pacific, Erie, and Manistee & Grand



Rapids, of which he was vice-president and general manager for several years. He had devoted himself entirely to consulting work since 1907. He had been a member of the A.S.M.E. since 1904, manager of the society from 1914 to 1917 and a vice-president during the next two years. He also established a $15,000 fund, the income from which is used for loans to students.

T. STURGIS BARNES, sales manager for Moore Drydock & Shipbuilding Co., Oakland, Calif., died there Dec. 31, as the result of a heart attack two days previously. He came to San Francisco in 1907. He was assistant to J. J. TYNAN there when he left in 1918 to join Moore Drydock. A year later he returned to Bethlehem Shipbuilding, which had acquired the Union plant, and was in charge of its Los Angeles plant in 1925, when he again joined the Moore company.

CHARLES S. BROWN, 79, chairman of the board of directors, Hall & Brown Woodworking Machine Co., 1913 No. Broadway, St. Louis, Mo., died at his home in Huntleigh Village, Jan. 5. Mr. Brown joined forces with the late GORHAM O. HALL in 1877 in the opening of a machine shop in St. Louis. This shop was the beginning of Hall & Brown.

BENJAMIN B. CANN, 42, vessel builder interested in the Moteghan Shipbuilding Co., Moteghan, N. S., died Jan. 5 at his home in Yarmouth, N. S., of pneumonia.

FRANK G. CONNELLY, 37, head of the inspection department, Kelly press division, American Type Founders Co., Elizabeth, N. J., died at his home there Jan. 11, after a brief illness.

CHARLES W. CURTISS, 50, president and general manager of Waterbury (Conn.) Clock Co., for the past three months, died Jan. 10 of angina pectoris at the Waterbury Hospital. He was formerly connected with Torrington Co., and had been at different times president of seven of its subsidiaries.

EDWARD C. DUNMEYER, 69, Indianapolis, one organizer of Diamond Chain & Mfg. Co., died at his home recently. For many years he had been vice-president.

GILBERT W. GOODRIDGE, 57, first vice-president, Bead Chain Co., and formerly assistant manager of Bryant Electric Co., died in Bridgeport, Conn., Jan. 5.

FRED HOFFMANN, 60, president of Hoffmann & Billings Mfg. Co., Milwaukee, manufacturer of plumbing equipment, died recently after a brief illness. He joined the company, founded by his father in 1857, as a youth. Upon his father's death in 1894, he became president.

HAMILTON L. LINDSAY, president of Lindsay Wire Weaving Co., Cleveland, died Jan. 8 there. Mr. Lindsay, with the assistance of ALEXANDER WINTON and others, organized the company bearing his name, having invented a machine for weaving wire cloth. He was chairman of the board, Niagara Wire Weaving Co., Niagara Falls, Ont., and president of Liberty Reed Co., Cleveland.

J. THOMAS MOLTRUP, 61, president of Moltrup Steel Products Co., Beaver Falls, Pa., died there Jan. 13. He helped to organize the Standard Gauge Co., merged with Union Drawn Steel Co., and in 1914, with his brother, the late STEPHEN MOLTRUP, founded Moltrup Steel Products Co.

HENRY T. PORTER, 63, retired chief engineer of Bessemer & Lake Erie Railroad, died Jan. 11 at his home in Greenville, Pa. He had been retired about a year.

CHARLES L. ROGERS, 72, formerly president of Sligo Furnace Co., St. Louis, and an executive with American Car & Foundry Co. for 35 years, died recently. He had retired four years ago.

WILLIAM STRIEBEL, 50, mechanical engineer for Seagrave Mfg. Co., Chicago, Ill., died recently.

OLIVER STUBBS, past president of the Institute of British Foundrymen and formerly joint managing director of Joseph Stubbs, Ltd., Manchester, England, manufacturer of textile machinery and castings, died Jan. 4.

J. B. SWIFT, 82, former president of Eagle-Picher Lead Co., world's largest independent lead concern, died Jan. 14 in Cincinnati a few hours after he had been admitted to a hospital.

GEORGE H. THOMPSON, 61, president of Columbus (Ohio) Malleable Iron Co., died Jan. 11 there after a two-year illness from heart disease. He had been with the company for the past 21 years.

JAMES F. WALSH, 47, vice-president of Moline Iron Works, died Jan. 10 at his home in Oak Park, Ill., following two weeks' illness. He was also manager of the Elkhart division, Chicago Hardware Foundry Co.

WILLIAM A. WOOD, 80, retired manufacturer, died at Dunstable, Mass., Jan. 5. He retired in 1921 from the presidency of William T. Wood Ice Tool Co., Arlington, Mass., founded by his father.